RP 2913'



HOBBS OCD JUN 2 8 2013

May 10, 2013

RECEIVED

Mr. Geoffrey Leking Environmental Engineer Specialist Oil Conservation Division, District 1 1625 North French Drive Hobbs, New Mexico 88240

approved Environmental Specialist NMOCO-DIST 1 122114

# Re: Assessment Work Plan for the NMR Energy, LLC., Barnhill and Post Tank Battery, Unit L, Section 1, Township 14 South, Range 37 East, Lea County, New Mexico.

Mr. Leking:

Tetra Tech, Inc. (Tetra Tech) was contacted by NMR Energy, LLC., (NMR) to assess a reportedly historical impact at the Barnhill and Post Tank Battery, Unit L, Section 1, Township 14 South, Range 37 East, Lea County, New Mexico (Site). The site coordinates are N 33.13336°, W 103.16141°. The site location is shown on Figures 1 and 2.

## Background

#### Historical Release

The NMOCD requested NMR Energy to submit a State of New Mexico C-141 Initial Report for a reportedly historical spill that occurred under the previous operator of the facility.

### Recent Release

After the historical spill was assessed, but before it could be remediated, a second recent release occurred. According to the C-141, the second spill released 3 barrels of crude oil and produced water, and then the next day a rainfall event occurred, which carried the fluids throughout the tank battery, and the caused the spill to cover the area around the storage tanks. All of the fluid was contained inside the facility's firewalls. Due to the rainfall event, 22 barrels of fluid (3 barrels of crude oil and produced water,

Tetra Tech



and 19 barrels of rainwater) were recovered. The C-141 form is enclosed in Appendix A.

### Groundwater

The New Mexico State Engineer's Office Well Reports showed one well in Section 1, with a reported groundwater depth of 50' below surface. In additional, wells were also noted in Section 2, 11 and 14, near the site, with depths to groundwater ranging from 46' to 100' below surface. The USGS data also showed groundwater depths ranging from 85' to 120' below surface. According to the NMOCD groundwater map and data, the depth to groundwater in this area is approximately 80' below surface. A private water well used by the landowner is located is located in the northwest corner of Section 12, approximately 0.5 miles south of the tank battery was measured by Tetra Tech personnel and measured 86' below ground surface. The groundwater data is shown in Appendix B.

## Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX. Based upon the depth to groundwater, the proposed RRAL for TPH is 1,000 mg/kg.

#### Assessment

### **Historical Release**

On July 17, 2012, representatives from Tetra Tech and Helms Oil and Gas met with Mr. Geoffrey Leking with the NMOCD onsite to inspect and confirm the sampling locations at the facility. Mr. Leking selected two (2) locations to assess the subsurface soils from historical impact at the tank battery. On October 9, 2012, Tetra Tech installed two (2) backhoe trenches (T-1 and T-2) inside the berm to evaluate and vertically define extents of subsurface impact. Selected samples were analyzed for TPH analysis by



EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. The sampling results are summarized in Table 1. The trench locations are shown on Figure 3. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix C.

Referring to Table 1, T-1 samples showed a TPH concentration above the RRAL in the 1.0' sample of 3,161 mg/Kg, but the concentrations decrease to below 50 mg/Kg in the 2' sample. Trench 2 (T-2) showed no hydrocarbon impact to the area.

Elevated chloride concentrations were detected in T-1 from surface to a depth of 5.0' below surface. The concentrations were 2,230 mg/Kg in the 1.0' sample, and spiked to 2,830 mg/Kg in the 4.0' sample, then significantly declined to 1,010 mg/kg in the 5.0', bottom hole sample. Deeper samples could not be collected due to the dense caliche formation. The chloride impact was not vertically defined.

Elevated chloride concentrations were also detected in T-2. The concentrations were 76.7 mg/Kg in the 1.0' sample, and significantly increased to 744 mg/Kg in the 2.0 sample, and 749 mg/Kg in the 4.0 sample before declining to 389 mg/Kg in the 6.0' sample. Deeper samples could not be collected due to the dense caliche formation. The chloride impact in the area of T-2 was vertically defined.

### Work Plan

On November 30, 2012, a second release occurred at the site and will require an assessment, as requested by the NMOCD. The spill footprint is shown on Figure 3. Tetra Tech personnel will oversee the installation of four (4) boreholes in the release area to assess and define the extent of the contamination. As shown on Figure 3, the proposed borehole (BH-4) will be installed to assess the recent release as well as the historical release (T-1) in the area.

A drilling rig will be utilized, and all down hole equipment (i.e., drill rods, drill bits, etc.) will be thoroughly decontaminated between each borehole with a high-pressure hot water wash and rinse. The proposed boreholes are shown on Figure 3.

The samples selected for analysis will be determined from field observation and data. All samples will be collected and preserved in laboratory prepared sample containers with standard QA/QC procedures. All samples will be shipped under proper chain-of-custody control and analyzed within the standard holding times. The soil samples will be analyzed for Total



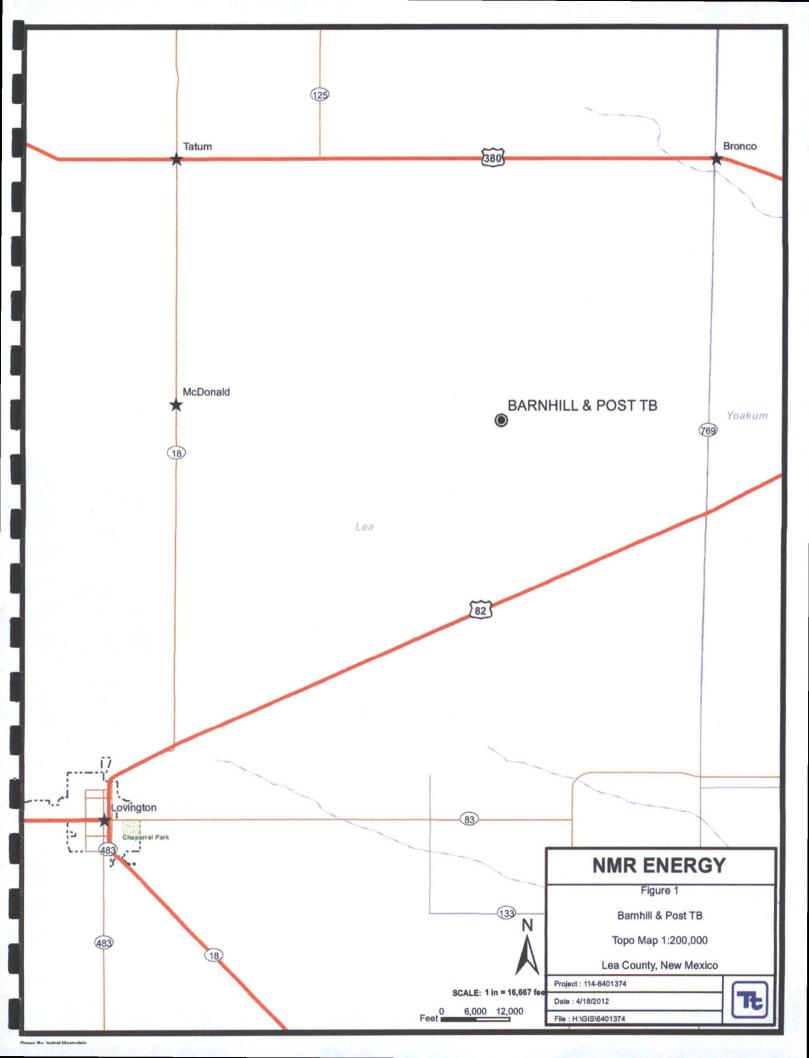
Petroleum Hydrocarbon (TPH) by method 8015 DRO/GRO, Benzene, Toluene, Ethyl benzene, and Xylene (BTEX) by method EPA Method 8021B and chloride by method EPA method 300.

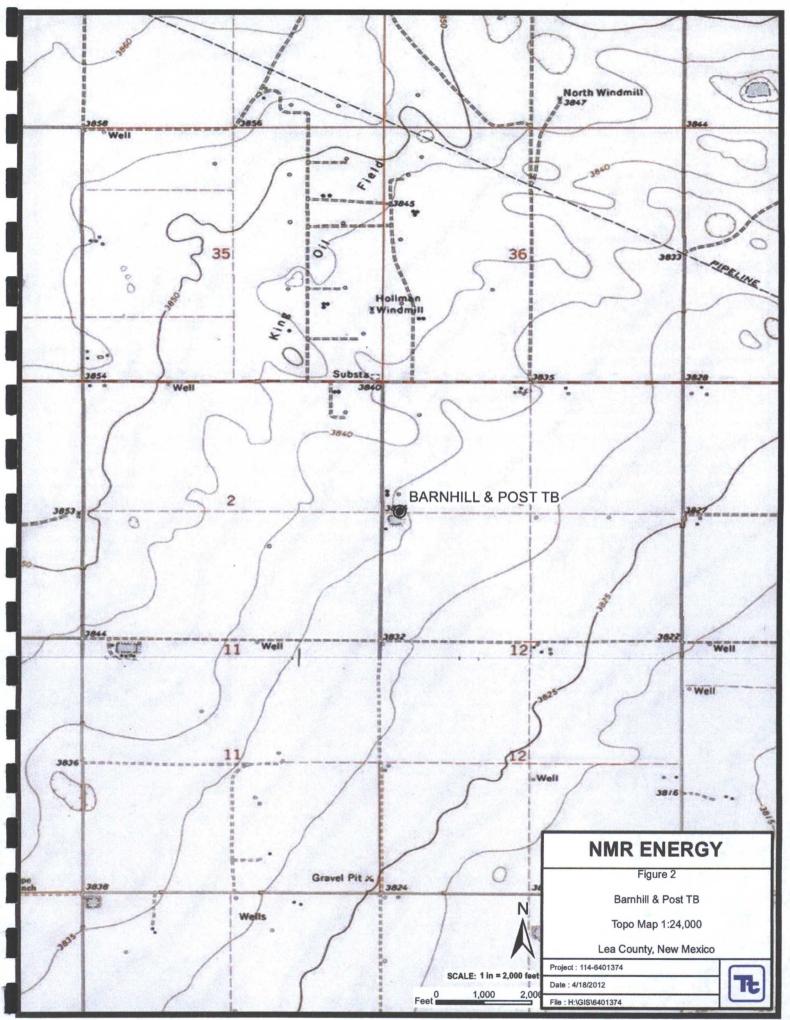
Once the analytical data has been received and review, a remediation work plan will be prepared for both spill areas and submitted to the NMOCD for approval. If you have any questions or comments concerning the proposed work plan, please call me at (432) 682-4559.

Respectfully submitted, TETRA TECH

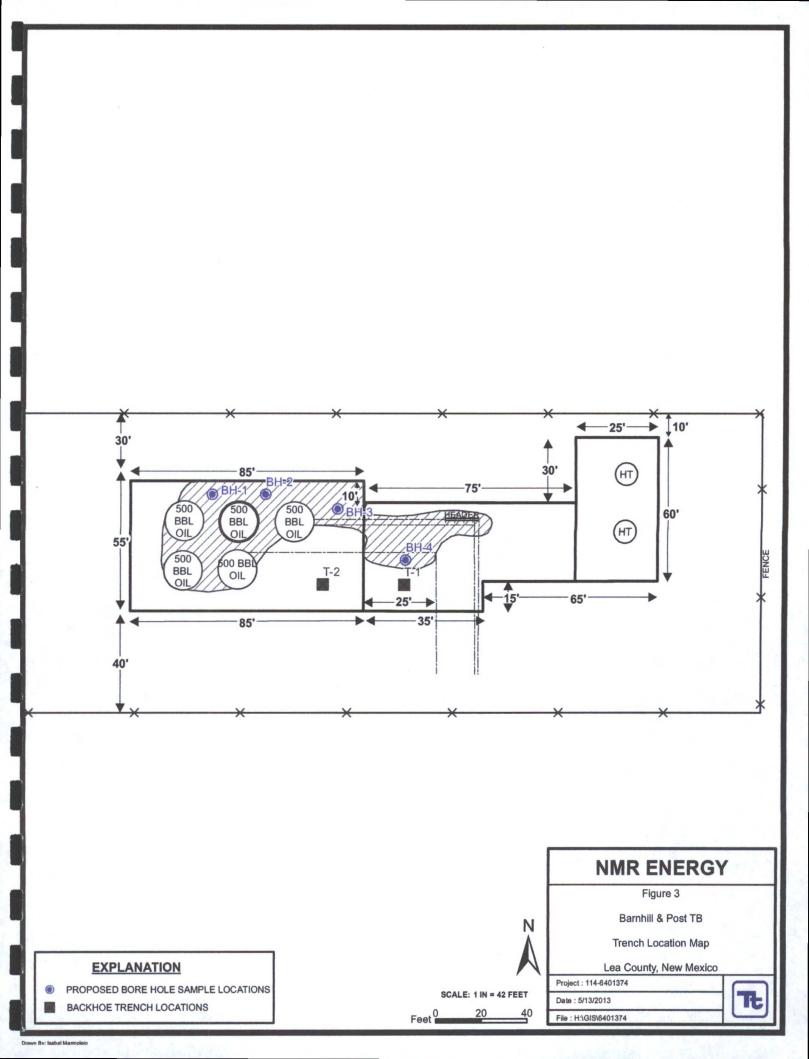
James F. Kennedy Project Manager

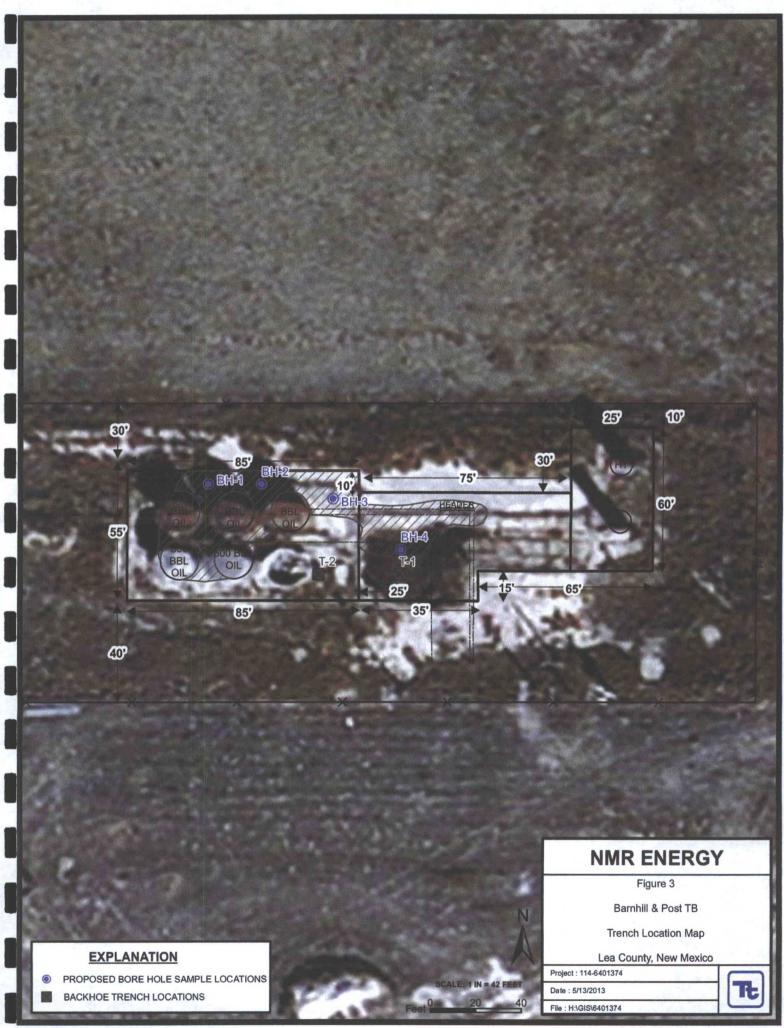
cc: Hollie Lamb – Helm Daniel Baker - Tumbleweed





Drawn By: Isabel Marmoleje





Drawn By: Isabel Mamolejo

# Table 1 NMR Energy LLC Barnhill and Post Tank Battery Lea County, New Mexico

Sample	Sample	Sample	Soil	Soil Status	TF	TPH (mg/kg)	(B)	Benzene	Toluene	Ethlvbenzene	Xvlene	Total	Chloride
Q	Date		In-Situ	Removed	GRO	DRO	Total	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	BTEX (mg/kg)	(mg/kg)
T-1	10/9/2012	0-1	×		1.03	3,160	3,161	<0.0200	<0.0200	<0.0200	<0.0200	<0.0200	2,230
	=	2	×		19.9	<50.0	19.9			1	,		2,510
	=	4	×			ı				ı	1	-	2,830
	=	5	×			1	1						1,010
T-2	10/9/2012	0-1	×		<1.00	<50.0	<50.0 <50.0	<0.0200 <0.0200	<0.0200	<0.0200	<0.0200	<0.0200	76.7
	=	2	×		,	1				-	,		744
	=	4	×			1	'			1		•	749
	=	9	×							,	•		389

(--) Not Analyzed Exceeding RRAL PHOTOGRAPHIC DOCUMENTATION NMR Energy, LLC Post and Barnhill Tank Battery Lea County, New Mexico



Photo 1. View of T-1 location.



Photo 2. View of T-2 location.

# PHOTOGRAPHIC DOCUMENTATION

NMR Energy, LLC Post and Barnhill Tank Battery Lea County, New Mexico



Photo 3. View of T-1 being installed.



Photo 4. View of T-2.

HOBBS OCD District [ State of New Mexico Form C-141 1625 N. French Dr., Hobbs, NM 88240 Energy Minerals and Natural Resources Revised August 8, 2011 District II APR 1 8 2013 811 S. First St., Artesia, NM 88210 Submit I Copy to appropriate District Office in District III **Oil Conservation Division** 1000 Rio Brazos Road, Aztec, NM 87410 accordance with 19.15.29 NMAC. 1220 South St. Francis Dr. District IV 1220 S. St. Francis Dr., Santa Fe, NM 87505 RECEIVED Santa Fe, NM 87505 **Release Notification and Corrective Action OPERATOR** Initial Report Final Report Name of Company NMR Energy LLC Contact Daniel Baker 800 Bering Drive, STE 250 Houston, TX 77057 (432) 559-7520 Telephone No. Address Facility Type Facility Name Post and Barnhill Battery Battery Mineral Owner Kirby Schenck Trust/Tierra Oil Surface Owner Bos Dairy (Issak) API No. 30-025-28507 28576 (POSTH3) Comp. LOCATION OF RELEASE Feet from the North/South Line Feet from the East/West Line Unit Letter Section Township Range County D 1 14-S 37-E 330 North 330' West Lea Latitude Longitude NATURE OF RELEASE Type of Release Oil and Produced Water Volume of Release 3 bbls Volume Recovered 3 bbls Source of Release Hatch on oil tank leaked Date and Hour of Occurrence Date and Hour of Discovery 11/30/2012 12/1/2012 Was Immediate Notice Given? If YES, To Whom? 🗌 Yes 🛛 No 🗌 Not Required By Whom? Date and Hour Was a Watercourse Reached? If YES, Volume Impacting the Watercourse. Yes X No If a Watercourse was Impacted, Describe Fully.\* Describe Cause of Problem and Remedial Action Taken.\* Oil tank #211 had a hatch leak. Estimated 3 bbls of oil and produced water released on ground. The following day, it rained. A vacuum truck was called out to assist in picking up fluid on surface and rain water. Picked up 3 bbls of reportable spill. Transferred 9" (22 bbls) to tank #212. Pulled hatch and jetted tank clean. Checked tank for leaks. Gasket around hatch was determined to be bad. Replaced gasket and hatch. Loaded tank with 130 bbls of FW. Test tank for 4 days. Held good. NMR Energy is proposing to scrape the surface with a backhoe and have the contaminated soil hauled off. We will then replace with fresh caliche and smooth surface. Describe Area Affected and Cleanup Action Taken.\* I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal. state, or local laws and/or regulations. OIL CONSERV ATION DIVISION Signature: Approved by Environmental Speciali ist nvironmental Specialis Printed Name: Daniel Baker Approval Date: 4/30/13 Expiration Date: 7/01 Title: VP of Engineering Conditions of Approval: CONFIRMATION E-mail Address: dbaker@tumblewcedllc.com Attached 🗌 SAMPLING SHUVEN BE PERRORMED RP-4-13-2913 WHICH DISALAYS THAT THE 4/18/2013 Phone: (432) 559-7520 Date: Attach Additional Sheets If Necessary CONTRAMINATION WAS ADEDUATELY

FINAL C-141 DUE BY 7/01/13

# Water Well Data Average Depth to Groundwater (ft) NMR - Barnhill and Post Tank Battery Lea County, New Mexico

	13 Sc	outh	36	East	
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

	14 :	South	:	36 Eas	t
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

	15 9	South	:	36 East	ast		
6	5	4	3	2	1		
7	8	9	10	11	12		
18	17	16	15	14	13		
19	20	21	22	23	24		
30	29	28	27	26	25		
31	32	33	34	35	36		

	13 S	outh	;	37 East	
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27 75	26 55	25 40
31	32	33	34	35 65 80	36 78 40 65

	14 Sc	outh	37	East	
6 <b>85</b>	5	4	3 32	2 55 46	1 85 50
7	8 42	9	10 62	11 85 60	12 <b>85</b>
18	17	16	15 50	14 100	13 120
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

	15 \$	South	:	37 Eas	t
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

	13 Se	outh	3	8 East
6	5	4	3	2
7	8	9	10	11
18	17	16	15	14
19	20	21	22	23
53	40			
30	29	28	27	26
85				
31	32	33	34	35
87				

		14	Sc	outh		3	8 East
6	77	5	45	4		3	2
7		8		9	45	10	11
18 115		17		16		15	14
19 4 65	40	20		21		22	23
30		29		28		27	26
31		32		33		34	35

	15 Sc	outh	38	East
6	5	4	3	2
7	8	9	10	11
18	17	16	15	14
19	20	21	22	23
30	29	28	27	26
31	32	33	34	35

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

- **90** Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6) Geology and Groundwater Resources of Eddy County, NM (Report 3)
- 34 NMOCD Groundwater Data
- 123 Tetra Tech installed temporary wells and field water level
- 143 NMOCD Groundwater map well location

Page Number: 1 of 2

Report Date: October 18, 2012

Work Order: 12101038

# **Summary Report**

Ike Tavarez Tetra Tech 1910 N. Big Spring Street Midland, TX 79705

Project Location:Lea Co., NMProject Name:NMR Energy LLC/Barnhill Tank BatteryProject Number:114-6401374

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
311453	T-1 (0-1')	soil	2012-10-09	00:00	2012-10-10
311454	T-1 (2')	soil	2012-10-09	00:00	2012-10-10
311455	T-1 (4')	soil	2012-10-09	00:00	2012-10-10
311456	T-1 (5')	soil	2012-10-09	00:00	2012-10-10
311457	T-2 (0-1')	soil	2012-10-09	00:00	2012-10-10
311458	T-2 (2')	soil	2012-10-09	00:00	2012-10-10
311459	T-2 (4')	soil	2012-10-09	00:00	2012-10-10
311460	T-2 (6')	soil	2012-10-09	00:00	2012-10-10

		]	BTEX		TPH DRO - NEW	TPH GRO
	Benzene	Toluene	Ethylbenzene	Xylene	DRO	GRO
Sample - Field Code	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
311453 - T-1 (0-1')	< 0.0200	< 0.0200	< 0.0200	< 0.0200	3160	1.03
311454 - T-1 (2')					<50.0	19.9
311457 - T-2 (0-1')	< 0.0200	< 0.0200	< 0.0200	< 0.0200	<50.0	<1.00

#### Sample: 311453 - T-1 (0-1')

Param	Flag	Result	Units	RL
Chloride		2230	mg/Kg	4

### Sample: 311454 - T-1 (2')

Param	Flag	Result	Units	RL
Chloride		2510	mg/Kg	4

TraceAnalysis, Inc. • 6701 Aberdeen Ave., Suite 9 • Lubbock, TX 79424-1515 • (806) 794-1296 This is only a summary. Please, refer to the complete report package for quality control data.

Report Date: October 18, 2012		Work Order: 12101038	Page N	Page Number: 2 of 2		
Sample: 311455	- T-1 (4')					
Param	Flag	Result	Units	RL		
Chloride		2830	mg/Kg	4		
Sample: 311456 ·	- T-1 (5')					
Param	Flag	Result	Units	RL		
Chloride	0	1010	m mg/Kg	4		
Sample: 311457 ·	- T-2 (0-1')					
Param	Flag	Result	Units	RL		
Chloride		76.7	mg/Kg	4		
Sample: 311458 -	- T-2 (2')					
Param	Flag	Result	Units	RL		
Chloride		744	mg/Kg	4		
Sample: 311459 -	- T-2 (4')					
Param	Flag	Result	Units	RL		
Chloride	· · · · · · · · · · · · · · · · · · ·	749	m mg/Kg	4		
Sample: 311460 -	- T-2 (6')					
Param	Flag	Result	Units	RL		
Chloride	<u>v</u>	389	mg/Kg	4		



6701 Aberdeen Avenue, Suite 9 200 East Sunset Road, Suite E 5002 Basin Street, Suite A1 (BioAquatic) 2501 Mayes Rd., Suite 100

Lubbock, Texas 79424 El Paso Texas 79922 Texas 79703 Midland Carroliton. Texas 75006 E-Mail: lab@traceanalysis.com WEB: www.traceanalysis.com

800-378-1296 806-794-1296 915-585-3443 432-689-6301 972-242 -7750

FAX 806 - 794 - 1298 FAX 915-585-4944 FAX 432-689-6313

Certifications

WBE HUB NCTRCA DBE NELAP DoD LELAP Kansas Oklahoma ISO 17025

Analytical and Quality Control Report

Ike Tavarez Tetra Tech 1910 N. Big Spring Street Midland, TX, 79705

Report Date: October 18, 2012

Work Order: 12101038 ألفتها فغابة فللبة فللبة فللبة فللبة فغلبة فلنبخ فتغت

Project Location: Lea Co., NM Project Name: NMR Energy LLC/Barnhill Tank Battery **Project Number:** 114-6401374

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

			Date	Time	Date	
Sample	Description	Matrix	Taken	Taken	Received	
311453	T-1 (0-1')	soil	2012-10-09	00:00	2012-10-10	
311454	T-1 (2')	soil	2012-10-09	00:00	2012-10-10	
311455	T-1 (4')	soil	2012-10-09	00:00	2012-10-10	
311456	T-1 (5')	soil	2012-10-09	00:00	2012-10-10	
311457	T-2 (0-1')	soil	2012-10-09	00:00	2012-10-10	
311458	T-2 (2')	soil	2012-10-09	00:00	2012-10-10	
311459	T-2 (4')	soil	2012-10-09	00:00	2012-10-10	
311460	T-2 (6')	soil	2012-10-09	00:00	2012-10-10	

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 28 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Michael april

Dr. Blair Leftwich, Director Dr. Michael Abel, Project Manager

# **Report Contents**

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Analytical Report	
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Sample 311454 (T-1 (2'))	
Sample 311455 (T-1 (4'))	
Sample 311456 (T-1 (5'))	
Sample 311457 (T-2 (0-1'))	
Sample 311458 (T-2 (2'))	
Sample 311459 (T-2 (4'))	
Sample 311460 $(T-2(6'))$	
Aethod Blanks	
QC Batch 95681 - Method Blank (1)	
QC Batch 95682 - Method Blank (1)	
QC Batch 95757 - Method Blank (1)	
QC Batch 95758 - Method Blank (1)	
QC Batch 95773 - Method Blank (1)	
QC Batch 95818 - Method Blank (1)	
QC Batch 95844 - Method Blank (1)	
aboratory Control Spikes	
QC Batch 95681 - LCS (1)	
QC Batch 95682 - LCS (1)	
QC Batch 95757 - LCS (1)	
QC Batch 95758 - LCS (1)	
QC Batch 95773 - LCS (1)	
QC Batch 95818 - LCS (1)	
QC Batch 95844 - LCS (1)	
QC Batch 95681 - MS (1)	
QC Batch 95682 - MS (1)	
QC Batch 95757 - MS (1)	
QC Batch 95758 - MS (1)	
QC Batch 95773 - MS (1)	
QC Batch 95818 - MS (1)	
QC Batch 95844 - MS (1)	
1. Hundling Chandra da	
Calibration Standards QC Batch 95681 - CCV (1)	
QC Batch 95681 - CCV (2)	
QC Batch 95682 - CCV (1)	
QC Batch 95682 - CCV (2)	
QC Batch 95757 - CCV (1)	
QC Batch 95757 - CCV (2)	
QC Batch 95758 - CCV (1)	· · · ·
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# **Case Narrative**

Samples for project NMR Energy LLC/Barnhill Tank Battery were received by TraceAnalysis, Inc. on 2012-10-10 and assigned to work order 12101038. Samples for work order 12101038 were received intact at a temperature of -0.6 C.

Samples were analyzed for the following tests using their respective methods.

		Prep	Prep	QC	Analysis
Test	Method	Batch	Date	Batch	Date
BTEX	S 8021B	81075	2012-10-09 at 14:39	95681	2012-10-11 at 14:39
Chloride (Titration)	SM 4500-Cl B	81143	2012-10-15 at 12:12	95757	2012-10-16 at 16:13
Chloride (Titration)	SM 4500-Cl B	81143	2012-10-15 at 12:12	95758	2012-10-16 at 16:14
TPH DRO - NEW	S 8015 D	81152	2012-10-16 at 08:00	95773	2012-10-17 at 08:28
TPH DRO - NEW	S 8015 D	81211	2012-10-17 at 09:00	95844	2012-10-18 at 15:14
TPH GRO	S 8015 D	81075	2012-10-09 at 14:39	95682	2012-10-11 at 14:39
TPH GRO	S 8015 D	81184	2012-10-17 at 08:34	95818	2012-10-17 at $08:34$

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 12101038 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

Report Date: October 18, 2012 114-6401374 Work Order: 12101038 NMR Energy LLC/Barnhill Tank Battery Page Number: 6 of 28 Lea Co., NM

# Analytical Report

### Sample: 311453 - T-1 (0-1')

T 1 /	3 4: 11 1								
Laboratory:	Midland		A 1	1 Mathal	S 8021I	2		Deep Mathad	S 503
Analysis:	BTEX		Analytica					Prep Method:	
QC Batch:	95681		Date Ana	12	2012-10			Analyzed By:	YG
Prep Batch:	81075		Sample P	reparation	1: 2012-10	1-09		Prepared By:	YG
					RL				
Parameter		Flag	Cert		Result	Units		Dilution	R.
Benzene		U	1		< 0.0200	mg/Kg		1	0.020
Toluene		U	1	<	< 0.0200	mg/Kg		1	0.020
Ethylbenzene	е	U	1	<	< 0.0200	mg/Kg	5	1	0.020
Xylene		U	1	<	< 0.0200	mg/Kg	S	1	0.020
							Spike	Percent	Recover
Surrogate		Fla	g Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotolue	ene (TFT)			1.87	mg/Kg	1	2.00	94	70 - 130
4-Bromofluor	obenzene (4-BFE	3)		1.85	mg/Kg	1	2.00	92	70 - 130
Laboratory: Analysis:	1453 - T-1 (0-1 Midland Chloride (Titrat			ytical Me		4 4500-Cl B		Prep Metho	
Laboratory: Analysis: QC Batch:	Midland		Date	ytical Me Analyzec ple Prepar	l: 20 ration: 20	4 4500-Cl B 12-10-16 12-10-15		Prep Metho Analyzed By Prepared By	: AR
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titrat 95757	tion)	Date Samj	Analyzec ple Prepa	l: 20 ration: 20 RL	12-10-16 12-10-15	8	Analyzed By Prepared By	y: AR y: AR
Laboratory: Analysis: QC Batch:	Midland Chloride (Titrat 95757		Date	Analyzec ple Prepa	l: 20 ration: 20	12-10-16		Analyzed By	: AR
Laboratory: Analysis: QC Batch: Prep Batch: Parameter	Midland Chloride (Titrat 95757	tion)	Date Samj	Analyzec ple Prepa	l: 20 ration: 20 RL Result	12-10-16 12-10-15 Unit:		Analyzed By Prepared By Dilution	y: AR y: AR RI
Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride	Midland Chloride (Titrat 95757	tion) Flag	Date Samj	Analyzec ple Prepa	l: 20 ration: 20 RL Result	12-10-16 12-10-15 Unit:		Analyzed By Prepared By Dilution	y: AR y: AR RI
Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride Sample: 31: Laboratory:	Midland Chloride (Titrat 95757 81143 <b>1453 - T-1 (0-1</b> Midland	tion) Flag	Date Samj Cert	Analyzec ple Prepar	l: 20 ration: 20 RL Result 2230	12-10-16 12-10-15 Units mg/Kg		Analyzed By Prepared By Dilution 10	7: AR 7: AR <u>R</u> 4.0
Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride Sample: 31: Laboratory: Analysis:	Midland Chloride (Titrat 95757 81143 <b>1453 - T-1 (0-1</b> Midland TPH DRO - NE	tion) Flag	Date Samj Cert	Analyzec ple Prepar	l: 20 ration: 20 RL Result 2230 ethod: S	12-10-16 12-10-15 Unit: mg/Kg 8015 D		Analyzed By Prepared By Dilution 10 Prep Method	7: AR 7: AR <u>R:</u> 4.0
Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride Sample: 31: Laboratory: Analysis:	Midland Chloride (Titrat 95757 81143 <b>1453 - T-1 (0-1</b> Midland	tion) Flag	Date Samj Cert Ana Dat	Analyzec ple Prepar lytical Me e Analyze	l: 20 ration: 20 RL Result 2230 ethod: S ed: 20	12-10-16 12-10-15 Units mg/Kg		Analyzed By Prepared By Dilution 10 Prep Metho Analyzed By	<ul> <li>AR</li> <li>AR</li> <li>AR</li> <li>4.0</li> <li>A.0</li> <li>A.0</li> </ul>
Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride Sample: 31: Laboratory: Analysis: QC Batch:	Midland Chloride (Titrat 95757 81143 <b>1453 - T-1 (0-1</b> Midland TPH DRO - NE	tion) Flag	Date Samj Cert Ana Dat	Analyzec ple Prepar	l: 20 ration: 20 RL Result 2230 ethod: S ed: 20	12-10-16 12-10-15 Unit: mg/Kg 8015 D		Analyzed By Prepared By Dilution 10 Prep Method	7: AR 7: AR <u>R</u> 4.0 d: N/J 7: CW
Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride	Midland Chloride (Titrat 95757 81143 <b>1453 - T-1 (0-1</b> Midland TPH DRO - NE 95773	tion) Flag	Date Samj Cert Ana Dat	Analyzec ple Prepar lytical Me e Analyze	l: 20 ration: 20 RL Result 2230 ethod: S ed: 20	12-10-16 12-10-15 Unit: mg/Kg 8015 D 012-10-17		Analyzed By Prepared By Dilution 10 Prep Method Analyzed By Prepared By	<ul> <li>AR</li> <li>AR</li> <li>AR</li> <li>4.0</li> <li>A.0</li> <li>A.0</li> </ul>
Laboratory: Analysis: QC Batch: Prep Batch: Parameter Chloride Sample: 31: Laboratory: Analysis: QC Batch:	Midland Chloride (Titrat 95757 81143 <b>1453 - T-1 (0-1</b> Midland TPH DRO - NE 95773	tion) Flag	Date Samj Cert Ana Dat	Analyzec ple Prepar lytical Me e Analyze ple Prepa	l: 20 ration: 20 RL Result 2230 ethod: S ed: 24 aration: 24	12-10-16 12-10-15 Unit: mg/Kg 8015 D 012-10-17	5	Analyzed By Prepared By Dilution 10 Prep Metho Analyzed By	<ul> <li>AR</li> <li>AR</li> <li>R.</li> <li>4.0</li> <li>d: N/A</li> <li>r: CW</li> </ul>

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Surrogate		Flag	Cer	t.	Result	Units	Dilu	tion	Spi Amo		Percent Recovery	Recovery Limits
n-Tricosane	Qsr	Qsr			593	mg/Kg	5	5	10	0	593	55.1 - 135.7
Sample: 3114	53 - T-	1 (0-1')										
	Aidland	0			A 1	1.16 (1.1.1	0.001	r D				
U	TPH GR 5682	.0			Date An	al Method		-10-11			Prep Meth Analyzed	
	1075					Preparatio		10-09			Prepared 1	e .
							RL					
Parameter			Flag		Cert	]	Result		Unit	8	Dilution	RL
GRO					1		1.03		mg/K	5	1	1.00
										Spike	Percent	Recovery
Surrogate				Flag	Cert	Result	Units	Dil	ution	Amount	Recovery	Limits
Trifluorotoluene	e (TFT)					1.82	mg/Kg		1	2.00	91	70 - 130
4-Bromofluorob	enzene	(4-BFB)				1.75	mg/Kg		1	2.00	88	70 - 130

# Sample: 311454 - T-1 (2')

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Chloride		Tag	Cert	2510	mg/Kg	10	4.00
Parameter		Flag	Cert	RL Result	Units	Dilution	RL
Prep Batch:	81143		Sample I	Preparation:	2012-10-15	Prepared By:	AR
Laboratory: Analysis: QC Batch:	Midland Chloride (Titrati 95757	on)	Analytic Date An	al Method: alyzed:	SM 4500-Cl B 2012-10-16	Prep Method: Analyzed By:	'

# Sample: 311454 - T-1 (2')

Laboratory:	Midland						
Analysis:	TPH DRO - N	EW	Analyti	cal Method:	S 8015 D	Prep Method:	N/A
QC Batch:	95844		Date A	nalyzed:	2012-10-18	Analyzed By:	CW
Prep Batch:	81211		Sample	Preparation:	2012-10-17	Prepared By:	CW
				RL			
Parameter		Flag	Cert	Result	Units	Dilution	RL
DRO		Ъ	1	<50.0	mg/Kg	1	50.0

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Surrogate Flag	Cert	R	tesult	Units	Diluti			Percent Recovery	Recovery Limits		
n-Tricosane			94.4	mg/Kg	1	1	00	94	55.1 - 135.7		
Sample: 311454 - T-1 (2')											
Laboratory: Midland Analysis: TPH GRO			Analytic	al Method:	S 8015	5 D		Prep Meth	nod: S 5035		
QC Batch: 95818 Prep Batch: 81184			Date An Sample 1	alyzed: Preparation	2012-1 : 2012-1			Analyzed Prepared 1			
					RL						
Parameter	Flag		Cert	R	esult	Uni		Dilution	RL		
GRO	В		1		19.9	mg/ł	ſg	1	4.00		
							Spike	Percent	Recovery		
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits		
Trifluorotoluene (TFT)				1.99	mg/Kg	1	2.00	100	70 - 130		
4-Bromofluorobenzene (4-BFI	3)			1.81	mg/Kg	1	2.00	90	70 - 130		

# Sample: 311455 - T-1 (4')

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Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Tit 95757 81143	ration)	Analytical Method: Date Analyzed: Sample Preparation:		SM 4500-Cl B 2012-10-16 2012-10-15	Prep Method: Analyzed By: Prepared By:	AR
Depertur		Flog	Cert	RL Result	Units	Dilution	RL
Parameter Chloride		Flag	Cert	2830	mg/Kg	10	4.00

# Sample: 311456 - T-1 (5')

Laboratory:	Midland				
Analysis:	Chloride (Titration)	Analytical Method:	SM 4500-Cl B	Prep Method:	N/A
QC Batch:	95757	Date Analyzed:	2012-10-16	Analyzed By:	AR
Prep Batch:	81143	Sample Preparation:	2012-10-15	Prepared By:	AR

continued ...

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sample 311456 continued									
					RL				
Parameter	Flag		Cert		Result	Unit	S	Dilution	RI
					RL				
Parameter	Flag		Cert		Result	Unit		Dilution	RI
Chloride					1010	mg/K	g	10	4.00
Laboratory: Midland Analysis: BTEX QC Batch: 95681 Prep Batch: 81075		]	Date Ana	l Method: lyzed: reparatior	2012-10	-11		Prep Methoo Analyzed By Prepared By	: YG
Parameter	Flag		Cert		RL Result	Unit		Dilution	RI
Benzene	r lag		1 Lert	<	<0.0200	mg/Kg		1	0.0200
Toluene	υ		1		< 0.0200	mg/Kg		1	0.0200
Ethylbenzene	υ		1	<	< 0.0200	mg/Kg		1	0.0200
Xylene	υ		1	<	< 0.0200	mg/Kg	5	1	0.0200
							Spike	Percent	Recovery
Surrogate		Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)				1.95	mg/Kg	1	2.00	98	70 - 130
4-Bromofluorobenzene (4-BFB)				1.95	mg/Kg	1	2.00	98	70 - 130

ParameterFlagCertResultUnitsDilutionRLChloride76.7mg/Kg54.00

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Sample: 31	1457 - T-2 (	0-1')									
Laboratory: Analysis:	Midland TPH DRO -	NEW		A	alytical Me	thad.	8015 D		Drep M	ethe du	NI / A
QC Batch:	95773	NEW			te Analyzed		012-10-17		Prep M Analyze		N/A CW
Prep Batch:	81152				mple Prepar		012-10-16		Prepare		CW
						$\operatorname{RL}$					
Parameter		Flag		Cert		Result	Uni		Dilution		RL
DRO		U		1	<	<50.0	mg/F	g	1		50.0
Surrogate	Fla	g Cert	R	tesult	Units	Diluti		ike ount	Percent Recovery		overy mits
		0						- cquart	v		
n-Tricosane				89.7	mg/Kg	1	10	00	90	55.1	- 135.7
Sample: 31 Laboratory: Analysis: QC Batch:	<b>1457 - T-2 (</b> Midland TPH GRO 95682 81075	0-1')		Analytic Date An	cal Method:	S 8015 2012-1	5 D .0-11	00	90 Prep Met Analyzed Prepared	hod: By:	- 135.7 S 5035 YG YG
	Midland TPH GRO 95682	0-1')		Analytic Date An	cal Method: nalyzed:	S 8015 2012-1	5 D .0-11	00	Prep Met Analyzed	hod: By:	S 5035 YG
Sample: 31 Laboratory: Analysis: QC Batch: Prep Batch:	Midland TPH GRO 95682	0-1') Flag		Analytic Date An	cal Method: nalyzed: Preparation	S 801: 2012-1 1: 2012-1	5 D .0-11 .0-09 Uni	:5	Prep Met Analyzed	hod: By:	S 5035 YG
Sample: 31 Laboratory: Analysis: QC Batch:	Midland TPH GRO 95682			Analytic Date An Sample	cal Method: nalyzed: Preparation R	S 801: 2012-1 a: 2012-1 RL	5 D .0-11 .0-09	:5	Prep Met Analyzed Prepared	hod: By:	S 5035 YG YG
Sample: 31 Laboratory: Analysis: QC Batch: Prep Batch: Parameter GRO	Midland TPH GRO 95682	Flag	Flag	Analytic Date An Sample Cert	cal Method: nalyzed: Preparation R	S 801 2012-1 a: 2012-1 RL cesult <1.00	5 D .0-11 .0-09 Uni mg/K	s g Spike	Prep Met Analyzed Prepared Dilution 1 Percent	hod: By: By: Re	S 5035 YG YG RL 1.00 covery
Sample: 31 Laboratory: Analysis: QC Batch: Prep Batch: Parameter	Midland TPH GRO 95682 81075	Flag	Flag	Analytic Date An Sample Cert	cal Method: nalyzed: Preparation R	S 801: 2012-1 a: 2012-1 RL essult	5 D .0-11 .0-09 Uni	s g	Prep Met Analyzed Prepared Dilution 1 Percent	hod: By: By: Re L	S 5035 YG YG RL 1.00

# Sample: 311458 - T-2 (2')

Chloride			744	mg/Kg	5	4.00
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 95758 81143	Analytical Method: Date Analyzed: Sample Preparation:		SM 4500-Cl B 2012-10-16 2012-10-15	Prep Method: Analyzed By: Prepared By:	AR.

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Sample: 31	1459 - T-2 (4')					
Laboratory:	Midland					
Analysis:	Chloride (Titration)	Analytic	al Method:	SM 4500-Cl B	Prep Method	: N/A
QC Batch:	95758	Date An	alyzed:	2012-10-16	Analyzed By	AR
Prep Batch:	81143	Sample 1	Preparation:	2012-10-15	Prepared By:	AR
			RL			
Parameter	Flag	Cert	Result	Units	Dilution	RL
Chloride			749	mg/Kg	5	4.00

# Sample: 311460 - T-2 (6')

Laboratory: Analysis: QC Batch: Prep Batch:	Midland Chloride (Titration) 95758 81143	Date An	Analytical Method: Date Analyzed: Sample Preparation:		Prep Method: Analyzed By: Prepared By:	AR
Parameter	Flag	Cert	RL Result	Units	Dilution	RL
Chloride	riag	Cert	389	mg/Kg	5	4.00

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# Method Blanks

Method 1	Blank (1	) QC	Batch:	95681
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QC Batch:	95681	Date Analyzed:	2012-10-11	Analyzed By:	YG
Prep Batch:	81075	QC Preparation:	2012-10-09	Prepared By:	YG

					MDL			
Parameter	Flag		Cert		Result		Units	
Benzene			1		< 0.00100	1	mg/Kg	0.02
Toluene			1		< 0.00100	1	mg/Kg	0.02
Ethylbenzene			1		< 0.00110	1	mg/Kg	0.02
Xylene			1		< 0.00360	1	mg/Kg	0.02
	-	~			-	Spike	Percent	Recovery
Surrogate	Flag	Cert	Result	Units	Dilution	Amount	Recovery	Limits
Trifluorotoluene (TFT)			1.92	mg/Kg	1	2.00	96	70 - 130
4-Bromofluorobenzene (4-BFB)			1.85	mg/Kg	1	2.00	92	70 - 130

### Method Blank (1) QC Batch: 95682

QC Batch: 95682 Prep Batch: 81075			nalyzed: eparation:	2012-10-11 2012-10-09			0	l By: YG By: YG
Parameter	Flag		Cert		MDL Result		Units	RL
GRO	0		1		< 0.482		mg/Kg	1
Surrogate	Flag	Cert	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT) 4-Bromofluorobenzene (4-BFB)			1.84 1.72	mg/Kg mg/Kg	1 1	$2.00 \\ 2.00$	92 86	70 - 130 70 - 130

Method Blar	nk(1)	QC Batch: 95757
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QC Batch:	95757	Date Analyzed:	2012-10-16	Analyzed By:	AR
Prep Batch:	81143	QC Preparation:	2012-10-15	Prepared By:	AR

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Parameter	T	Flag		Cert		MDL Result		Units		RI
Chloride		IceS		CATU		<3.85		mg/Kg		4
								0, 0		
Method Blank (1)	QC Batch: 95	5758								
QC Batch: 95758 Prep Batch: 81143				nalyzed: eparation:	2012-10-16 2012-10-15			Analyze Prepare		AR AR
Parameter	F	Flag		Cert		MDL Result		Units		RI
Chloride		0				<3.85		mg/Kg		4
Method Blank (1) QC Batch: 95773 Prep Batch: 81152	QC Batch: 95	5773		nalyzed: paration:	2012-10-17 2012-10-16			Analyze Preparec		CW CW
Parameter	F	Flag		Cert		MDL Result		Units		R
DRO				1		<15.7		mg/Kg		50
Surrogate	Flag Cert	R	lesult	Units	Dilution	Spi		Percent Recovery		overy
n-Tricosane			89.1	mg/Kg	1	10		89	61.6 -	141.
Method Blank (1)	QC Batch: 95	818								
QC Batch: 95818 Prep Batch: 81184				nalyzed: paration:	2012-10-17 2012-10-17			Analyze Prepare		YG YG
Parameter	F	lag		Cert		MDL Result		Units		RJ
GRO				1		<1.22		mg/Kg		4
							Spike	Percent	Rec	cover
Surrogate	1	Flag	Cert	Result	Units	Dilution	Amoun	t Recovery	Li	mits

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method blank	continue	ł								
Chamman				Curt	Derest	TT:	Dilution	Spike	Percent	Recovery
Surrogate	1	(1.555)	Flag	Cert	Result	Units	Dilution	Amount	v	Limits
4-Bromofluor	robenzene	(4-BFB)			0.0786	mg/Kg	1	0.00	78	70 - 130
Method Bla	ank (1)	QC B	atch: 95844							
QC Batch:	ank (1) 95844 81211	QC B	atch: 95844		nalyzed: eparation:	2012-10-18 2012-10-17			Analyzed Prepared	0
Method Bla QC Batch: Prep Batch:	95844	QC B	atch: 95844		eparation:		MDL			0
QC Batch:	95844	QC B	atch: 95844 Flag				MDL Result	5		0
QC Batch: Prep Batch: Parameter	95844	QC B			eparation:				Prepared	l By: CW
QC Batch: Prep Batch:	95844	QC B			eparation: Cert		Result 27.4	ike	Prepared	l By: CW
QC Batch: Prep Batch: Parameter	95844	QC B			eparation: Cert		Result 27.4 Sp		Prepared Units mg/Kg	l By: CW RI 50

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# Laboratory Control Spikes

### Laboratory Control Spike (LCS-1)

QC Batch:	95681	Date Analyzed:	2012-10-11	Analyzed By:	YG
Prep Batch:	81075	QC Preparation:	2012-10-09	Prepared By:	YG

			LCS			Spike	Matrix		Rec.
Param	F	C	Result	Units	Dil.	Amount	Result	Rec.	Limit
Benzene		1	1.89	mg/Kg	1	2.00	< 0.00100	94	70 - 130
Toluene		1	1.88	mg/Kg	1	2.00	< 0.00100	94	70 - 130
Ethylbenzene		1	1.81	mg/Kg	1	2.00	< 0.00110	90	70 - 130
Xylene		1	5.72	mg/Kg	1	6.00	< 0.00360	95	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Benzene		1	1.92	mg/Kg	1	2.00	< 0.00100	96	70 - 130	2	20
Toluene		1	1.91	mg/Kg	1	2.00	< 0.00100	96	70 - 130	2	20
Ethylbenzene		1	1.82	mg/Kg	1	2.00	< 0.00110	91	70 - 130	1	20
Xylene		1	5.74	mg/Kg	1	6.00	< 0.00360	96	70 - 130	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	1.91	1.96	mg/Kg	1	2.00	96	98	70 - 130
4-Bromofluorobenzene (4-BFB)	1.90	1.93	mg/Kg	1	2.00	95	96	70 - 130

#### Laboratory Control Spike (LCS-1)

QC Batch: Prep Batch:	95682 81075					2012-10-11 2012-10-09			Analyzed By: Prepared By:		
				LCS		-	Spike	Matrix		Rec.	
Param		F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	
GRO			1	17.7	mg/Kg	1	20.0	< 0.482	88	70 - 130	

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

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control spikes continued												
D	D	a	LCSD	TT	D'1	Spike	Matr			ec.	DDD	RPD
Param	F	С	Result	Units	Dil.	Amount	Resu	lt Re	ec. Li	mit	RPD	Limit
			LCSD			Spike	Matr			ec.		RPD
Param	F	С	Result	Units	Dil.	Amount				mit	RPD	
GRO		1	17.4	mg/Kg	1	20.0	< 0.48			- 130	2	20
Percent recovery is based on the s	spike	resu	lt. RPD is	s based on	the s	spike and s	spike duj	plicate	result.			
			LCS	LCSI	D			Spike	LCS	LC	CSD	Rec.
Surrogate			Resul	lt Resul	lt	Units		mount	Rec.	R	lec.	Limit
Trifluorotoluene (TFT)			2.05			ng/Kg	1	2.00	102		.04	70 - 130
4-Bromofluorobenzene (4-BFB)			1.94	1.88	1	ng/Kg	1	2.00	97	(	94	70 - 130
				Analyzed: eparation:	201 201	2-10-15				Anal Prep	ared B	
Prep Batch: 81143 Param		F	QC Pro L C Re	eparation: CS esult	: 201 Units	12-10-15 Dil.	Spil Amo	unt	Matrix Result	Prep R	ec.	y: AR Rec. Limit
Prep Batch: 81143 Param Chloride	.1		QC Pro-L C Re- 2	eparation: CS esult 530 n	: 201 Units ng/Kg	Dil.	Amo 250	unt )0	Result <3.85	Prep R	ec.	y: AR Rec. Limit
Prep Batch: 81143 Param Chloride	spike		QC Pro-L C Re- 2	eparation: CS esult 530 n	: 201 Units ng/Kg	Dil.	Amo 250	unt )0	Result <3.85	Prep R	ec.	y: AR Rec. Limit
Prep Batch: 81143 Param Chloride Percent recovery is based on the s		resu	QC Pr L C Re 2: It. RPD is LCSD	eparation: CS sult 530 n based on	: 201 Units ng/Kg the s	Dil. g 1 pike and s Spike	Amo 250 pike dup Matri	unt 00 plicate : ix	Result <3.85 result. R	Prep R 10 ec.	ec. 01	y: AR Rec. Limit 85 - 11; RPD
Prep Batch: 81143 Param Chloride Percent recovery is based on the s Param	spike F		QC Pr L C Re 2: It. RPD is LCSD Result	eparation: CS sult 1 530 n based on Units	: 201 Units ng/Kg the s Dil.	Dil. g 1 pike and s Spike Amount	Amo 250 pike dup Matri Resul	unt 00 plicate : ix lt Re	Result <3.85 result. R c. Liz	Prep R 10 ec. mit	ec. 01 RPD	y: AR Rec. Limit 85 - 11: RPD Limit
Prep Batch: 81143 Param Chloride Percent recovery is based on the s Param Chloride	F	resu C	QC Pr L C Re 2: It. RPD is LCSD Result 2600	eparation: CS sult 530 n based on Units mg/Kg	Units ng/Kg the s Dil. 1	Dil. g 1 pike and s Spike Amount 2500	Amo 250 pike dup Matri Resul <3.8	unt 00 plicate : ix lt Re 5 10	Result           <3.85	Prep R 10 ec.	ec. 01	y: AR Rec. Limit 85 - 11; RPD
Prep Batch: 81143 Param Chloride Percent recovery is based on the s Param Chloride Percent recovery is based on the s	F	resu C resu	QC Pr L C Re 2: It. RPD is LCSD Result 2600	eparation: CS sult 530 n based on Units mg/Kg	Units ng/Kg the s Dil. 1	Dil. g 1 pike and s Spike Amount 2500	Amo 250 pike dup Matri Resul <3.8	unt 00 plicate : ix lt Re 5 10	Result           <3.85	Prep R 10 ec. mit	ec. 01 RPD	y: AR Rec. Limit 85 - 11: RPD Limit
Prep Batch: 81143 Param Chloride Percent recovery is based on the s Param Chloride Percent recovery is based on the s Laboratory Control Spike (LO	F	resu C resu	QC Pr L C Ra 2: It. RPD is LCSD Result 2600 It. RPD is	eparation: CS sult 530 n based on Units mg/Kg based on	Units ng/Kg the s Dil. 1 the s	Dil. g 1 pike and s Spike Amount 2500 pike and s	Amo 250 pike dup Matri Resul <3.8	unt 00 plicate : ix lt Re 5 10	Result           <3.85	Prep R ec. mit 115	ec. 01 RPD 3	y: AR Rec. Limit 85 - 11: RPD Limit 20
Prep Batch: 81143 Param Chloride Percent recovery is based on the s Param Chloride Percent recovery is based on the s Laboratory Control Spike (LO QC Batch: 95758	F	resu C resu	QC Pr L C Ra L C Ra LCSD Result 2600 It. RPD is	eparation: CS sult 530 n based on Units mg/Kg	Units ng/Kg the s Dil. 1 the s	Dil. g 1 pike and s Spike Amount 2500	Amo 250 pike dup Matri Resul <3.8	unt 00 plicate : ix lt Re 5 10	Result           <3.85	Prep R ec. mit 115	ec. 01 RPD	y: AR Rec. Limit 85 - 11: RPD Limit 20
Prep Batch: 81143 Param Chloride Percent recovery is based on the s Param Chloride Percent recovery is based on the s Laboratory Control Spike (LO QC Batch: 95758 Prep Batch: 81143	F	resu C resu	QC Pr L C Re LCSD Result 2600 It. RPD is Date A QC Pre	eparation: CS sult 530 n based on Units mg/Kg based on analyzed: eparation: CS	: 201 Units ng/Kg the s Dil. 1 the s 201 201	Dil. <u>J</u> <u>j</u> <u>j</u> <u>j</u> <u>j</u> <u>j</u> <u>j</u> <u>j</u> <u>j</u>	Amo 250 pike dup Matri Resu <3.8 pike dup Spił	unt 00 ix 1t Re 5 10 plicate	Result <3.85 result. R c. Lin 4 85 - result. Matrix	Prep R ec. mit 115 Anal; Prep	ec. 01 RPD 3 yzed By	y: AR Rec. Limit 85 - 11: RPD Limit 20 y: AR y: AR y: AR Rec.
Prep Batch: 81143 Param Chloride Percent recovery is based on the s Param Chloride Percent recovery is based on the s Laboratory Control Spike (LO QC Batch: 95758	F	resu C resu	QC Pr L C Re 24 It. RPD is LCSD Result 2600 It. RPD is Date A QC Pre L C Re	eparation: CS sult 530 n based on Units mg/Kg based on analyzed: eparation: CS sult	Units ng/Kg the s Dil. 1 the s	Dil. <u>5</u> 1 pike and s Spike <u>Amount</u> <u>2500</u> pike and s 2-10-16 2-10-15 Dil.	Amo 250 pike dup Matri Resul <3.8	unt 00 ix lt Re 5 10 plicate plicate	Result <3.85 result. R c. Li: 4 85 - result.	Prep R 10 ec. mit 115 Anal; Prepa R	ec. 01 RPD 3 yzed By ared By	y: AR Rec. Limit 85 - 115 RPD Limit 20 y: AR y: AR

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control spikes continued												
			LCSE			Spike	Matrix		Rec			RPD
Param	F	С	Resul	t Units	Dil.	Amount	Result	Rec	. Lim	it	RPD	Limit
			LCSE	``````````````````````````````````````		Spike	Matrix		Rec			RPD
Param	F	С	Resul		Dil.	Amount		Rec			RPD	Limit
Chloride	1	0	2670			2500	<3.85	107			4	20
Percent recovery is based on th	:1			01							-	20
Laboratory Control Spike ( QC Batch: 95773 Prep Batch: 81152	LCS-1	.)		e Analyze Preparati		2-10-17 2-10-16					ed By: ed By:	CW CW
rep baten, orroz			60	1.101/01/001	. 201	2-10-10			1	repart	cu by.	011
				LCS			Spike		trix			lec.
Param		F	C I	Result	Units	Dil.	Amount			lec.		imit
				183	mg/Kg	1	250	<1	5.7	73	66.9	- 119.9
Percent recovery is based on th			LCSD	) is based	on the s	pike and s Spike	spike dupli Matrix	cate re	esult. Rec.			
Percent recovery is based on th Param DRO	F	C	ult. RPI LCSD Result 171	) is based Units mg/Kg	on the s Dil. 1	pike and s Spike Amount 250	pike dupli Matrix Result <15.7	cate re Rec. 68	esult. Rec. Limit 66.9 - 11		RPD 7	
DRO Percent recovery is based on th Param DRO Percent recovery is based on th	F e spike	C 1 resu	lt. RPI LCSD Result 171 lt. RPI	) is based Units mg/Kg ) is based	on the s Dil. 1	pike and s Spike Amount 250 pike and s	pike dupli Matrix Result <15.7 pike dupli	cate re Rec. 68 cate re	Rec. Limit 66.9 - 11 esult.	9.9	7	Limit 20
Percent recovery is based on th Param DRO Percent recovery is based on th	F e spike LC:	C 1 resu	lt. RPI LCSD Result 171 lt. RPI LCSI	) is based Units mg/Kg ) is based	Dil. 1 on the s	pike and s Spike Amount 250 pike and s	pike dupli Matrix Result <15.7	cate re Rec. 68 cate re LCS	esult. Rec. Limit 66.9 - 11 esult. LCS	9.9 SD	7 R	Limit 20
Percent recovery is based on th Param DRO	F e spike	C 1 resu S ult	lt. RPI LCSD Result 171 lt. RPI	D is based Units mg/Kg D is based D It Un	Dil. 1 on the s	pike and s Spike Amount 250 pike and s	pike dupli Matrix Result <15.7 pike dupli Spike	cate re Rec. 68 cate re	esult. Rec. Limit 66.9 - 11 esult. LCS	9.9 SD c.	7 R Li	
Percent recovery is based on th Param DRO Percent recovery is based on th Surrogate n-Tricosane Laboratory Control Spike ( QC Batch: 95818	F e spike LC3 Resu 86.1	C 1 resu S ult 2	ult. RPI Result 171 ult. RPI LCSI Resul 79.3	D is based Units mg/Kg D is based D It Un	on the s Dil. 1 on the s its /Kg d: 201	pike and s Spike Amount 250 pike and s Dil. A 1 2-10-17	pike dupli Matrix Result <15.7 pike dupli Spike Amount	cate re Rec. 68 cate re LCS Rec.	esult. Rec. Limit 66.9 - 11 esult. LCS Rec 79	9.9 SD c.	7 R Li	Limit 20 ec. mit - 140.2 YG
Percent recovery is based on th Param DRO Percent recovery is based on th Surrogate n-Tricosane Laboratory Control Spike ( QC Batch: 95818 Prep Batch: 81184	F e spike LC3 Resu 86.3	C 1 resu S ult 2	lt. RPI Result 171 lt. RPI LCSI Resul 79.3	Units mg/Kg ) is based ) is based ) t Ur mg, e Analyze Preparati LCS	on the s Dil. 1 on the s its /Kg d: 201 on: 201	pike and s Spike Amount 250 pike and s Dil. A 1 2-10-17 2-10-17	pike dupli Matrix Result <15.7 pike dupli Spike Amount 100 Spike	Rec. 68 cate re LCS Rec. 86	esult. Rec. Limit 66.9 - 11 esult. LCS Rec 79 79 A P	9.9 SD 3. o	7 R Li 76.8 ed By: ed By:	Limit 20 ec. mit - 140.2 YG YG YG Rec.
Percent recovery is based on th Param DRO Percent recovery is based on th Surrogate n-Tricosane Laboratory Control Spike ( QC Batch: 95818 Prep Batch: 81184 Param	F e spike LC3 Resu 86.3	C 1 resu S ult 2	ult. RPI Result 171 It. RPI LCSI Resul 79.3	Units mg/Kg D is based D is based D ur mg, e Analyze Preparati LCS Result	on the s Dil. 1 on the s its /Kg d: 201 on: 201 Units	pike and s Spike Amount 250 pike and s Dil. A 1 2-10-17 2-10-17 Dil.	pike dupli Matrix Result <15.7 pike dupli Spike Amount 100 Spike Amount	Rec. 68 cate re LCS Rec. 86	esult. Rec. Limit 66.9 - 11 esult. LCS Rec 79 79 A P Matrix Result	9.9 SD 2. nalyz repare	7 R Li 76.8 ed By: ed By:	Limit 20 ec. mit - 140.2 YG YG YG Rec. Limit
Percent recovery is based on th Param DRO Percent recovery is based on th Surrogate n-Tricosane Laboratory Control Spike ( QC Batch: 95818 Prep Batch: 81184 Param GRO	F e spike LCS Resu 86.2	C i resu S ult 2 F	LCSD Result 171 It. RPI LCSI Resul 79.3 Data QC	Units mg/Kg D is based D is based D is based C ur mg, e Analyze Preparati LCS Result 21.9	on the s Dil. 1 on the s its /Kg d: 201 on: 201 Units mg/Kg	pike and s Spike Amount 250 pike and s Dil. A 1 2-10-17 2-10-17 2-10-17 2-10-17 2-10-17	pike dupli Matrix Result <15.7 pike dupli Spike Mount 100 Spike Amount 20.0	Cate ro Rec. 68 Cate ro LCS Rec. 86	esult. Rec. Limit 66.9 - 11 esult. LCS Rec 79 A P Matrix Result 3.6	9.9 SD 3. o	7 R Li 76.8 ed By: ed By:	Limit 20 ec. mit - 140.2 YG YG YG Rec. Limit
Percent recovery is based on th Param DRO Percent recovery is based on th Surrogate n-Tricosane Laboratory Control Spike ( QC Batch: 95818 Prep Batch: 81184	F e spike LCS Resu 86.2	C i resu S ult 2 F	lt. RPI Result 171 lt. RPI LCSI Resul 79.3 Data QC C	D is based Units mg/Kg D is based D It Ur mg, e Analyze Preparati LCS Result 21.9 D is based	on the s Dil. 1 on the s its /Kg d: 201 on: 201 Units mg/Kg	pike and s Spike Amount 250 pike and s Dil. A 1 2-10-17 2-10-17 2-10-17 Dil. 5 1 pike and s	spike dupli Matrix Result <15.7 spike dupli Spike Amount 100 Spike Amount 20.0 pike dupli	Cate ro Rec. 68 Cate ro LCS Rec. 86	esult. Rec. Limit 66.9 - 11 esult. LCS Rec 79 79 A P Matrix Result 3.6 esult.	9.9 SD c. nalyz repare Rec 110	7 R Li 76.8 ed By: ed By:	Limit 20 ec. mit 140.2 YG YG YG Rec. Limit ) - 130
Percent recovery is based on th Param DRO Percent recovery is based on th Surrogate n-Tricosane Laboratory Control Spike ( QC Batch: 95818 Prep Batch: 81184 Param GRO	F e spike LCS Resu 86.2	C i resu S ult 2 F	LCSD Result 171 It. RPI LCSI Resul 79.3 Data QC	D is based Units mg/Kg D is based D t Ur mg, e Analyze Preparati LCS Result 21.9 D is based	on the s Dil. 1 on the s its /Kg d: 201 on: 201 Units mg/Kg	pike and s Spike Amount 250 pike and s Dil. A 1 2-10-17 2-10-17 2-10-17 2-10-17 2-10-17	pike dupli Matrix Result <15.7 pike dupli Spike Mount 100 Spike Amount 20.0	Cate ro Rec. 68 Cate ro LCS Rec. 86	esult. Rec. Limit 66.9 - 11 esult. LCS Rec 79 A P Matrix Result 3.6 esult. Rec.	9.9 SD c. nalyz repare Rec 110	7 R Li 76.8 ed By: ed By:	Limit 20 ec. mit - 140.2 YG YG YG Rec.

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Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

	LCS	LCSD			Spike	LCS	LCSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)	2.03	2.00	mg/Kg	1	2.00	102	100	70 - 130
4-Bromofluorobenzene (4-BFB)	2.10	2.10	mg/Kg	1	2.00	105	105	70 - 130

#### Laboratory Control Spike (LCS-1)

QC Batch:	95844	Date Analyzed:	2012-10-18	Analyzed By:	CW
Prep Batch:	81211	QC Preparation:	2012-10-17	Prepared By:	CW

			LCS			Spike	Matrix		Rec.
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit
DRO		1	282	mg/Kg	1	250	27.4	102	66.9 - 119.9

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

			LCSD			Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
DRO		1	242	mg/Kg	1	250	27.4	86	66.9 - 119.9	15	20
Percent recovery is based	l on the spike	e res	ult. RPD	is based	on the	spike and	spike duj	olicate	result.		
	IC	C.	LCST	<b>`</b>			Cnilto	IC	e i ced	т	Dag

	LUS	LCDD			Бріке	LCD	LCDD	nec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	126	92.7	mg/Kg	1	100	126	93	76.8 - 140.2

### Matrix Spike (MS-1) Spiked Sample: 311465

	95681 31075			)ate Analy: 2C Prepara		2-10-11 2-10-09			Analyzed Prepared	v
Param		F	С	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec.
Benzene			1	2.31	mg/Kg	1	2.00	< 0.00100	116	70 - 130
Toluene			1	2.33	mg/Kg	1	2.00	< 0.00100	116	70 - 130
Ethylbenzene			1	2.26	mg/Kg	1	2.00	< 0.00110	113	70 - 130
Xylene			1	7.12	mg/Kg	1	6.00	< 0.00360	119	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

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matrix spikes continued											
D		a	MSD		D.1	Spike	Matrix	D	Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limi	t RPI	) Limit
			MSD			Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limi	t RPI	
Benzene		1	2.34	mg/Kg	g 1	2.00	< 0.00100	) 117	70 - 13	30 1	20
Toluene		1	2.35	mg/Kg	g 1	2.00	< 0.00100	) 118	70 - 13	30 1	20
Ethylbenzene		1	2.30	mg/Kg		2.00	< 0.00110	) 115	70 - 13	30 2	20
Xylene		1	7.24	mg/Kg		6.00	< 0.00360	) 121	70 - 13	30 2	20
Percent recovery is based on the	spike	e rest	ılt. RPD	is based	l on the	spike and	spike dupl	cate res	ult.		
			N	IS I	MSD		5	pike	MS	MSD	Rec.
Surrogate			Re	sult F	Result	Units	Dil. A	nount	Rec.	Rec.	Limit
Trifluorotoluene (TFT)			1.	95	1.94	mg/Kg	1	2	98	97	70 - 130
1 Dromofly on homenon (1 DED)			1	95	1.93	mg/Kg	1	2	98	96	70 - 130
	ed Sa	mple				07 0					
4-Bromofluorobenzene (4-BFB) <b>Matrix Spike (MS-1)</b> Spik QC Batch: 95682	ed Sa	mple	: 311465	Analyze		012-10-11			Aı	nalyzed E	y: YG
Matrix Spike (MS-1) Spik QC Batch: 95682	ed Sa	mple	: 311465 Date		ed: 2					nalyzed E repared B	v
<b>Matrix Spike (MS-1)</b> Spik QC Batch: 95682 Prep Batch: 81075	ed Sa		:: 311465 Date QC 1	Analyze Preparat MS	ed: 20 ion: 20	012-10-11 012-10-09	Spike		Pr	repared B	y: YG Rec.
<b>Matrix Spike (MS-1)</b> Spik QC Batch: 95682 Prep Batch: 81075 Param	ed Sa	mple	:: 311465 Date QC 1	Analyza Preparat MS Result	ed: 24 ion: 24 Unit	012-10-11 012-10-09 s Dil.	Amour	t R	Pr atrix esult	repared B Rec.	y: YG Rec. Limit
Matrix Spike (MS-1) Spik QC Batch: 95682 Prep Batch: 81075 Param GRO		F	: 311465 Date QC 1 C 1	Analyze Preparat MS Result 15.8	ed: 2 ion: 2 Unit mg/F	1000000000000000000000000000000000000	Amour 20.0	t Ro	Pr atrix esult 0.482	repared B	y: YG Rec. Limit
Matrix Spike (MS-1) Spik QC Batch: 95682 Prep Batch: 81075 Param GRO		F	: 311465 Date QC 1 C 1	Analyze Preparat MS Result 15.8	ed: 2 ion: 2 Unit mg/F	1000000000000000000000000000000000000	Amour 20.0	t Ro	Pr atrix esult 0.482	repared B Rec.	y: YG Rec. Limit
Matrix Spike (MS-1) Spik QC Batch: 95682 Prep Batch: 81075 Param GRO Percent recovery is based on the	spike	F	: 311465 Date QC I C I It. RPD MSD	Analyze Preparat MS Result 15.8 is based	ed: 2 ion: 2 Unit mg/F l on the	012-10-11 012-10-09 s Dil. Gg 1 spike and s Spike	Amour 20.0 spike dupli Matrix	t R <0 cate res	Pr atrix esult 0.482 ult. Rec.	Rec. 79	y: YG Rec. Limit 70 - 130 RPD
Matrix Spike (MS-1) Spik QC Batch: 95682 Prep Batch: 81075 Param GRO Percent recovery is based on the Param		F rest C	: 311465 Date QC I C I It. RPD MSD Result	Analyzz Preparat MS Result 15.8 is based Units	ed: 2 ion: 2 Unit mg/F l on the g Dil.	012-10-11 012-10-09 s Dil. (g 1 spike and s Spike Amount	Amour 20.0 spike dupli Matrix Result	t R <( cate res Rec.	Pr atrix esult 0.482 ult. Rec. Limit	Rec. 79 RPD	y: YG Rec. Limit 70 - 130 RPD Limit
Matrix Spike (MS-1) Spik QC Batch: 95682 Prep Batch: 81075 Param GRO Percent recovery is based on the Param GRO	spike	F resu C	C 1 Date QC 1 C 1 I It. RPD MSD Result 15.8	Analyze Preparat MS Result 15.8 is based Units mg/K	ed: 24 ion: 24 Unit mg/H l on the g 1	012-10-11 012-10-09 s Dil. (g 1 spike and s Spike Amount 20.0	Amour 20.0 spike dupli Matrix Result <0.482	t R <0 cate res Rec. 79	Pr atrix esult 0.482 ult. Rec. Limit 70 - 13	Rec. 79 RPD	y: YG Rec. Limit 70 - 130 RPD
Matrix Spike (MS-1) Spik QC Batch: 95682 Prep Batch: 81075 Param GRO Percent recovery is based on the Param	spike	F resu C	C I Date QC I C I It. RPD MSD Result 15.8 Ilt. RPD	Analyze Preparat MS Result 15.8 is based Units mg/K is based	ed: 24 ion: 26 Unit mg/F l on the g 1 on the	012-10-11 012-10-09 s Dil. (g 1 spike and s Spike Amount 20.0	Amour 20.0 spike dupli Matrix Result <0.482 spike dupli	t R cate res   Rec.   79   cate res	Pr atrix esult 0.482 ult. Rec. Limit 70 - 13 ult.	Rec. 79 RPD 60 0	y: YG Rec. Limit 70 - 130 RPD Limit 20
Matrix Spike (MS-1) Spik QC Batch: 95682 Prep Batch: 81075 Param GRO Percent recovery is based on the Param GRO Percent recovery is based on the	spike	F resu C	C 1 Date QC 1 C 1 I It. RPD MSD Result 15.8 It. RPD	Analyze Preparat MS Result 15.8 is based Units mg/K is based IS	ed: 24 ion: 24 Unit mg/H l on the g 1 l on the MSD	012-10-11 012-10-09 s Dil. (g 1 spike and s Spike Amount 20.0 spike and s	Amour 20.0 spike dupli Matrix Result <0.482 spike dupli	t R <( cate res Rec. 79 cate res pike	Pr atrix esult 0.482 ult. Rec. Limit 70 - 13 ult. MS	Rec. 79 RPD 00 0 MSD	y: YG Rec. Limit 70 - 130 RPD Limit 20 Rec.
Matrix Spike (MS-1) Spik QC Batch: 95682 Prep Batch: 81075 Param GRO Percent recovery is based on the Param GRO	spike	F resu C	C 1 Date QC 1 C 1 I It. RPD MSD Result 15.8 It. RPD	Analyze Preparat MS Result 15.8 is based Units mg/K is based IS I sult R	ed: 24 ion: 26 Unit mg/F l on the g 1 on the	012-10-11 012-10-09 s Dil. (g 1 spike and s Spike Amount 20.0	Amour 20.0 spike dupli Matrix Result <0.482 spike dupli	t R cate res   Rec.   79   cate res	Pr atrix esult 0.482 ult. Rec. Limit 70 - 13 ult.	Rec. 79 RPD 60 0	y: YG Rec. Limit 70 - 130 RPD Limit 20

Matrix Spike (MS-1) Spiked Sample: 311457

QC Batch:	95757	Date Analyzed:	2012-10-16	Analyzed By:	AR
Prep Batch:	81143	QC Preparation:	2012-10-15	Prepared By:	AR

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				MS			Spike	M	atrix		Rec.
Param		F	C 1	Result	Units	Dil.	Amount		esult Red		Limit
Chloride				2600	mg/Kg		2500		76.7 10		3.9 - 121
Percent recovery is based or	the spik	e res	ult. RPD				spike dupl				
			MSD			Spike	Matrix		Rec.		RPD
Param	F	С	Result	Units	Dil.	Amount	Result	Rec.	Limit	RPD	Limit
Chloride			2730	mg/Kg	5 S	2500	76.7	106	78.9 - 121	5	20
Matrix Spike (MS-1) QC Batch: 95758 Prep Batch: 81143	Spiked S	ample	Date	e Analyze Preparat		12-10-16 12-10-15				yzed By ared By	y: AR. 7: AR.
				MS			Spike		atrix		Rec.
Param		F		Result	Units	Dil.	Amount		esult Rec		Limit
Chloride				3440	mg/Kg	10	2500	1	941 100	) 78	.9 - 121
Percent recovery is based or Param	f the spik		MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride		_	3720	mg/Kg	10	2500	941	111	78.9 - 121	8	20
Matrix Spike (MS-1)	Spiked Sa	ample	e: 311450								
QC Batch: 95773 Prep Batch: 81152				Analyze Preparati		12-10-17 12-10-16				red By:	
Prep Batch: 81152 Param		F	QC I	Preparati MS esult	on: 201 Units		Spike Amount	Mat Res	Prepa trix ult Rec.	red By:	
Prep Batch: 81152		F	QC I	Preparati MS esult	on: 201	2-10-16	_		Prepa trix ult Rec.	red By: I L	CW Rec.
Prep Batch: 81152 Param	the spik		QC I	Preparati MS esult 229	on: 201 Units mg/Kg	Dil.	Amount 250	Res 4	Prepa trix ult Rec. 8 72	red By: I L	CW Rec.
Prep Batch: 81152 Param DRO Percent recovery is based on		e resi	QC 1 C R ult. RPD MSD	Preparati MS esult 229 is based	0n: 201 Units mg/Kg on the s	Dil. 1 spike and s Spike	Amount 250 spike dupli Matrix	Res 42 cate re	Prepa trix ult Rec. 8 72 sult. Rec.	red By:	CW Rec. imit - 147.2 RPD
Prep Batch: 81152 Param DRO	the spik		QC 1 C R 1 ult. RPD	Preparati MS esult 229	0n: 201 Units mg/Kg on the s	Dil. 1 spike and s	Amount 250 spike dupli Matrix	Res 40 cate re Rec.	Prepa trix ult Rec. 8 72 sult.	red By: I L	CW Rec. imit - 147.2

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Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	L	Rec. imit
n-Tricosane	90.5	90.0	mg/Kg	1	100	90	90	78.3	- 131.6
Matrix Spike (MS-1)	Spiked Samp	0. 211772							
QC Batch: 95818 Prep Batch: 81184	Spiked Samp	Date A		012-10-17 012-10-17				yzed By ared By	
Param	F		IS sult Uni	ts Dil.	Spike Amour		atrix sult R	ec.	Rec. Limit
GRO			3.4  mg/		20.0				0 - 130
Param GRO Percent recovery is based	F C	23.6	Units Dil mg/Kg 1 based on the	20.0	<1.22	Rec. 118	Rec. Limit 70 - 130	RPD 1	RPD Limit 20
i creede recovery is build	on the spike re	MS Result	MSD	Units	5	bpike nount	MS M Rec. R		Rec. Limit
					1	2	102 1	.00 7	0 - 130
Trifluorotoluene (TFT)		2.03	2.00	mg/Kg	1				
Surrogate Trifluorotoluene (TFT) 4-Bromofluorobenzene (4-	BFB)	2.03 2.13	2.00 2.13	mg/Kg mg/Kg	1	2			
Trifluorotoluene (TFT)	BFB) Spiked Sampl	2.13 e: 311454 Date Ar	2.13 nalyzed: 2				106 1 Analy		0 - 130 CW
Trifluorotoluene (TFT) 4-Bromofluorobenzene (4- Matrix Spike (MS-1) QC Batch: 95844 Prep Batch: 81211	Spiked Sampl	2.13 e: 311454 Date Ar	2.13 nalyzed: 2 paration: 2	mg/Kg 012-10-18 012-10-17	1 Spike	2 Matri:	106 1 Analy Prepa	06 7 vzed By: ared By:	0 - 130 CW
Trifluorotoluene (TFT) 4-Bromofluorobenzene (4- Matrix Spike (MS-1) QC Batch: 95844	Spiked Sampl	2.13 e: 311454 Date An QC Pre MS	2.13 nalyzed: 2 paration: 2 lt Units	mg/Kg 012-10-18 012-10-17 Dil.	1	2	106 1 Analy Prepa	06 7 vzed By: wred By: F L	CW CW CW
Trifluorotoluene (TFT) 4-Bromofluorobenzene (4- <b>Matrix Spike (MS-1)</b> QC Batch: 95844 Prep Batch: 81211 Param	Spiked Sampl F	2.13 e: 311454 Date An QC Pres MS C Resu 1 218 ult. RPD is	2.13 nalyzed: 2 paration: 2 lt Units mg/Kg	mg/Kg 012-10-18 012-10-17 Dil. g 1 spike and	1 Spike Amount 250 spike dupli	2 Matri Result 37.2	106 1 Analy Prepa x t Rec. 72 lt.	06 7 vzed By: wred By: F L	CW CW CW Rec. imit - 147.2
Trifluorotoluene (TFT) 4-Bromofluorobenzene (4- Matrix Spike (MS-1) QC Batch: 95844 Prep Batch: 81211 Param DRO	Spiked Sampl F	2.13 e: 311454 Date An QC Pres MS C Resu 1 218 ult. RPD is MSD	2.13 nalyzed: 2 paration: 2 lt Units mg/Kg	mg/Kg 012-10-18 012-10-17 Dil. 5 1	1 Spike Amount 250 spike dupli Matrix	2 Matri Result 37.2	106 1 Analy Prepa x t Rec. 72	06 7 vzed By: wred By: F L	CW CW CW Rec. imit

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result. *continued* ...

Report Date: October 18, 2012 114-6401374			Work Order ergy LLC/Ba				Page Nu	mber: 22 of 28 Lea Co., NM
matrix spikes continued	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
	MS	MSD			Spike	MS	MSD	Rec.
Surrogate	Result	Result	Units	Dil.	Amount	Rec.	Rec.	Limit
n-Tricosane	86.8	mg/Kg	1	100	93	87	78.3 - 131.6	

Report Date: October 18, 2012 114-6401374

Work Order: 12101038 NMR Energy LLC/Barnhill Tank Battery Page Number: 23 of 28 Lea Co., NM

# **Calibration Standards**

Standard (CCV-1)

QC Batch: 95681			Date Ana	alyzed: 201	2-10-11		Analy	zed By: YG
				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene		1	mg/kg	2.00	1.97	98	80 - 120	2012-10-11
Toluene		1	mg/kg	2.00	1.97	98	80 - 120	2012-10-11
Ethylbenzene		1	mg/kg	2.00	1.88	94	80 - 120	2012-10-11
Xylene		1	mg/kg	6.00	5.93	99	80 - 120	2012-10-11

#### Standard (CCV-2)

QC Batch: 98	5681			Date Ana	Analy	zed By: YG			
					CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param		Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Benzene			1	mg/kg	2.00	1.92	96	80 - 120	2012-10-11
Toluene			1	mg/kg	2.00	1.91	96	80 - 120	2012-10-11
Ethylbenzene			1	mg/kg	2.00	1.79	90	80 - 120	2012-10-11
Xylene			1	mg/kg	6.00	5.64	94	80 - 120	2012-10-11

#### Standard (CCV-1)

QC Batch:	95682		Date	Analyzed:	2012-10-11		Analy	zed By: YG
				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
GRO		1	mg/Kg	20.0	18.6	93	80 - 120	2012-10-11

Standard (CCV-2)

QC Batch: 95682

Date Analyzed: 2012-10-11

Analyzed By: YG

Report Date: 0 114-6401374	October 18, 2	012	NMR E		er: 12101038 Barnhill Tanl	k Battery	Page Nu	mber: 24 of 2 Lea Co., NM
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		1	mg/Kg	20.0	23.5	118	80 - 120	2012-10-11
Standard (CC	CV-1)							
QC Batch: 95	757		Date A	Analyzed: 2	012-10-16		Analy	zed By: AR
9C Batch: 95757			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date	
							Timita	Analyzed
Chloride	Flag	Cert	Units mg/Kg	Conc. 100	Conc. 100	Recovery 100	Limits 85 - 115	
Chloride		Cert		Conc.				
Chloride Standard (CC	CV-2)	Cert	mg/Kg	Conc. 100			85 - 115	2012-10-10
Param Chloride Standard (CC QC Batch: 957 Param	C <b>V-2</b> ) 757	Cert	mg/Kg	Conc. 100	100		85 - 115	2012-10-10
Chloride Standard (CC QC Batch: 957	CV-2)		mg/Kg Date A	Conc. 100 Analyzed: 2 CCVs True	100 012-10-16 CCVs Found	100 CCVs Percent	85 - 115 Analy Percent Recovery	2012-10-10 zed By: AR Date Analyzed
Chloride Standard (CC QC Batch: 957 Param Chloride Standard (CC	2 <b>V-2</b> ) 757 Flag 2 <b>V-1</b> )		mg/Kg Date A Units mg/Kg	Conc. 100 Analyzed: 2 CCVs True Conc. 100	100 012-10-16 CCVs Found Conc.	100 CCVs Percent Recovery	85 - 115 Analy Percent Recovery Limits 85 - 115	2012-10-10 zed By: AR Date Analyzed 2012-10-10
Chloride Standard (CC QC Batch: 957 Param	2 <b>V-2</b> ) 757 Flag 2 <b>V-1</b> )		mg/Kg Date A Units mg/Kg	Conc. 100 Analyzed: 2 CCVs True Conc. 100	100 012-10-16 CCVs Found Conc. 100 012-10-16 CCVs	100 CCVs Percent Recovery	85 - 115 Analy Percent Recovery Limits 85 - 115 Analy Percent	2012-10-10 zed By: AR Date
Chloride Standard (CC QC Batch: 957 Param Chloride Standard (CC	2 <b>V-2</b> ) 757 Flag 2 <b>V-1</b> )		mg/Kg Date A Units mg/Kg	Conc. 100 Analyzed: 2 CCVs True Conc. 100 Analyzed: 2 CCVs	100 012-10-16 CCVs Found Conc. 100 012-10-16	100 CCVs Percent Recovery 100 CCVs	85 - 115 Analy Percent Recovery Limits 85 - 115 Analy	2012-10-10 zed By: AR Date Analyzed 2012-10-10 zed By: AR

QC Batch: 95758

Date Analyzed: 2012-10-16

Analyzed By: AR

114-6401374	October 18, 2	012	NMR E		er: 12101038 Barnhill Tanl	k Battery	Page Nu	mber: 25 of 2 Lea Co., NM
				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride	1 1005	Cert	mg/Kg	100	99.8	100	85 - 115	2012-10-16
Standard (C	CV-1)							
QC Batch: 9	5773		Date A	Analyzed: 2	2012-10-17		Analy	zed By: CW
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
D	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Param				050	070			2012-10-17
DRO		1	mg/Kg	250	278	111	80 - 120	2012-10-1
DRO Standard (C	CV-2)				278	111		zed By: CW
DRO Standard (C	CV-2)					CCVs		
DRO Standard (C	CV-2)			Analyzed: 2	2012-10-17		Analy	
DRO Standard (C QC Batch: 9 Param	CV-2)		Date A Units	Analyzed: 2 CCVs True Conc.	2012-10-17 CCVs Found Conc.	CCVs	Analy: Percent Recovery Limits	zed By: CW Date Analyzed
Param DRO Standard (C QC Batch: 9 Param DRO	<b>CV-2)</b> 5773	1	Date A	Analyzed: 2 CCVs True	2012-10-17 CCVs Found	CCVs Percent	Analy: Percent Recovery	zed By: CW Date Analyzed
DRO Standard (C QC Batch: 9 Param	<b>CV-2)</b> 5773 Flag	ı Cert	Date A Units	Analyzed: 2 CCVs True Conc.	2012-10-17 CCVs Found Conc.	CCVs Percent Recovery	Analy: Percent Recovery Limits	zed By: CW Date
DRO Standard (C QC Batch: 9 Param DRO	CV-2) 5773 Flag CV-3)	ı Cert	Date A Units mg/Kg	Analyzed: 2 CCVs True Conc. 250	2012-10-17 CCVs Found Conc.	CCVs Percent Recovery	Analy: Percent Recovery Limits 80 - 120	zed By: CW Date Analyzed
DRO Standard (C QC Batch: 9 Param DRO Standard (C	CV-2) 5773 Flag CV-3)	ı Cert	Date A Units mg/Kg	Analyzed: 2 CCVs True Conc. 250 Analyzed: 2 CCVs	2012-10-17 CCVs Found Conc. 233	CCVs Percent Recovery 93 CCVs	Analy: Percent Recovery Limits 80 - 120 Analy: Percent	zed By: CW Date Analyzed 2012-10-17
DRO Standard (C QC Batch: 9 Param DRO Standard (C	<b>CV-2)</b> 5773 Flag <b>CV-3)</b> 5773	ı Cert ı	Date A Units mg/Kg Date A	Analyzed: 2 CCVs True Conc. 250 Analyzed: 2 CCVs True	2012-10-17 CCVs Found Conc. 233 2012-10-17 CCVs Found	CCVs Percent Recovery 93 CCVs Percent	Analy: Percent Recovery Limits 80 - 120 Analy: Percent Recovery	zed By: CW Date Analyzed 2012-10-17 zed By: CW Date
DRO Standard (C QC Batch: 9 Param DRO Standard (C	CV-2) 5773 Flag CV-3)	ı Cert	Date A Units mg/Kg	Analyzed: 2 CCVs True Conc. 250 Analyzed: 2 CCVs	2012-10-17 CCVs Found Conc. 233 2012-10-17 CCVs	CCVs Percent Recovery 93 CCVs	Analy: Percent Recovery Limits 80 - 120 Analy: Percent	zed By: CW Date Analyzed 2012-10-17 zed By: CW

Standard (CCV-4)

QC Batch: 95773

Date Analyzed: 2012-10-17

Analyzed By: CW

114-6401374	October 18, 2	2012	NMR E	Work Or Energy LLC	Page Nu	Page Number: 26 of 28 Lea Co., NM			
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	
DRO		1	m mg/Kg	250	211	84	80 - 120	2012-10-17	
Standard (C	CV-1)								
QC Batch: 95	5818		Date	Analyzed:	2012-10-17		Analy	zed By: YG	
<sub>2</sub> C Batch: 95818				CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date	
				~	0	Recovery	Limits	Analyzed	
	Flag	Cert	Units mg/Kg	Conc. 1.00	Conc. 0.948	95	80 - 120		
GRO									
GRO Standard (C	CV-2)		mg/Kg				80 - 120	2012-10-1	
Param GRO Standard (C QC Batch: 98	CV-2)		mg/Kg	1.00 Analyzed: CCVs	0.948 2012-10-17 CCVs	95 CCVs	80 - 120 Analy Percent	2012-10-1 zed By: YG	
GRO <b>Standard (C</b> QC Batch: 98	<b>CV-2)</b> 5818		mg/Kg	1.00 Analyzed:	0.948 2012-10-17	95 CCVs Percent	80 - 120 , Analy	2012-10-1 zed By: YG Date	
GRO Standard (C QC Batch: 98 Param	CV-2)	1	mg/Kg Date	1.00 Analyzed: CCVs True	0.948 2012-10-17 CCVs Found	95 CCVs	80 - 120 Analy Percent Recovery	2012-10-1 zed By: YG Date Analyzed	
GRO Standard (C	<b>CV-2)</b> 5818 Flag	ı Cert	mg/Kg Date Units	1.00 Analyzed: CCVs True Conc.	0.948 2012-10-17 CCVs Found Conc.	95 CCVs Percent Recovery	80 - 120 Analy Percent Recovery Limits	2012-10-1 zed By: YG	
GRO Standard (C QC Batch: 98 Param GRO	CV-2) 5818 Flag CV-3)	ı Cert	mg/Kg Date Units mg/Kg	1.00 Analyzed: CCVs True Conc.	0.948 2012-10-17 CCVs Found Conc.	95 CCVs Percent Recovery	80 - 120 Analy Percent Recovery Limits 80 - 120	2012-10-1 zed By: YG Date Analyzed	
GRO Standard (C QC Batch: 98 Param GRO Standard (C	CV-2) 5818 Flag CV-3)	ı Cert	mg/Kg Date Units mg/Kg	1.00 Analyzed: CCVs True Conc. 1.00 Analyzed: CCVs	0.948 2012-10-17 CCVs Found Conc. 0.968 2012-10-17 CCVs	95 CCVs Percent Recovery 97 CCVs	80 - 120 Analy Percent Recovery Limits 80 - 120 Analy Percent	2012-10-1 zed By: YG Date Analyzed 2012-10-17 zed By: YG	
GRO Standard (C QC Batch: 98 Param GRO Standard (C	CV-2) 5818 Flag CV-3)	ı Cert	mg/Kg Date Units mg/Kg	1.00 Analyzed: CCVs True Conc. 1.00 Analyzed:	0.948 2012-10-17 CCVs Found Conc. 0.968 2012-10-17	95 CCVs Percent Recovery 97	80 - 120 Analy Percent Recovery Limits 80 - 120 Analy	2012-10-1 zed By: YG Date Analyzed 2012-10-1	

Standard (CCV-1)

QC Batch: 95844

Date Analyzed: 2012-10-18

Analyzed By: CW

Report Date: 114-6401374	October 18,	2012	NMR E	Work O Energy LLO	Page Nu	Lea Co., NM			
Param	Flag	Cert	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	
DRO		1	mg/Kg	250	257	103	80 - 120	2012-10-18	
Standard (C) QC Batch: 95			Date .	Analyzed:	2012-10-18		Analy	zed By: CW	
				CCVs	CCVs	CCVs	Percent		
				True	Found	Percent	Recovery	Date	
Param	Flag	Cert	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
DRO		1	mg/Kg	250	217	87	80 - 120	2012-10-18	
Standard (C) QC Batch: 95			Date 4	Date Analyzed:			Analyz	vzed By: CW	
				CCVs	CCVs	CCVs	Percent		
			True		Found	Percent	Recovery	Date	
				True	- O GILLG				
Param DRO	Flag	Cert	Units mg/Kg	Conc. 250	Conc. 214	Recovery 86	Limits 80 - 120	Analyzed 2012-10-1	

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# Appendix

# **Report Definitions**

NameDefinitionMDLMethod Detection LimitMQLMinimum Quantitation LimitSDLSample Detection Limit

## Laboratory Certifications

	Certifying	Certification	Laboratory
$\mathbf{C}$	Authority	Number	Location
-	NCTRCA	WFWB384444Y0909	TraceAnalysis
-	DBE	VN 20657	TraceAnalysis
-	HUB	1752439743100-86536	TraceAnalysis
-	WBE	237019	TraceAnalysis
1	NELAP	T104704392-12-4	Midland

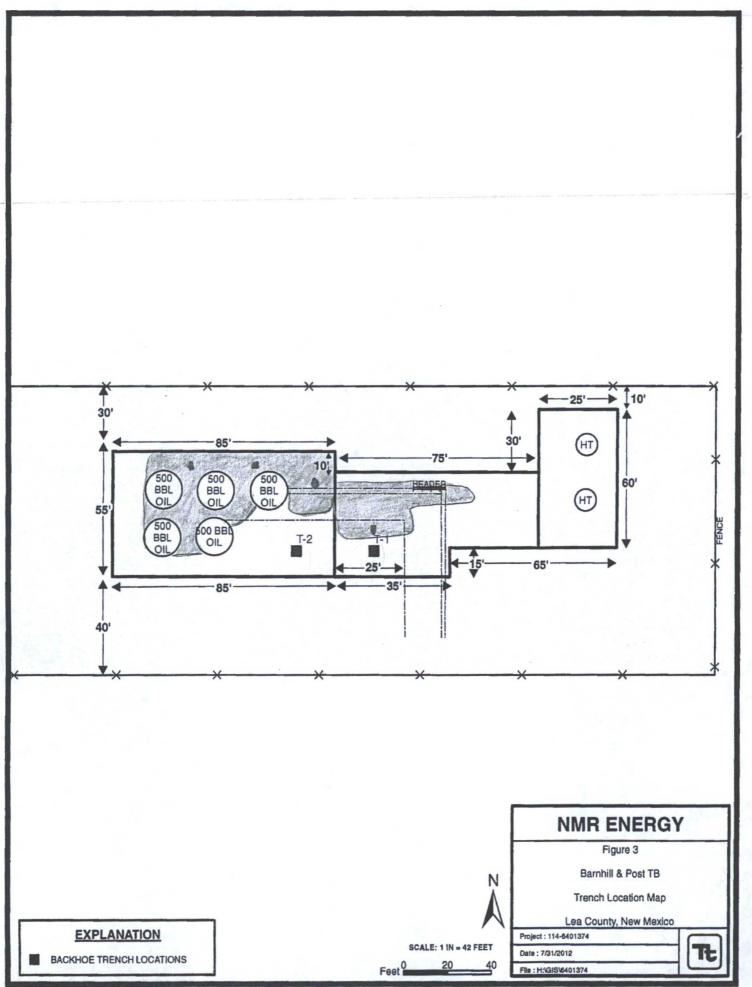
# Standard Flags

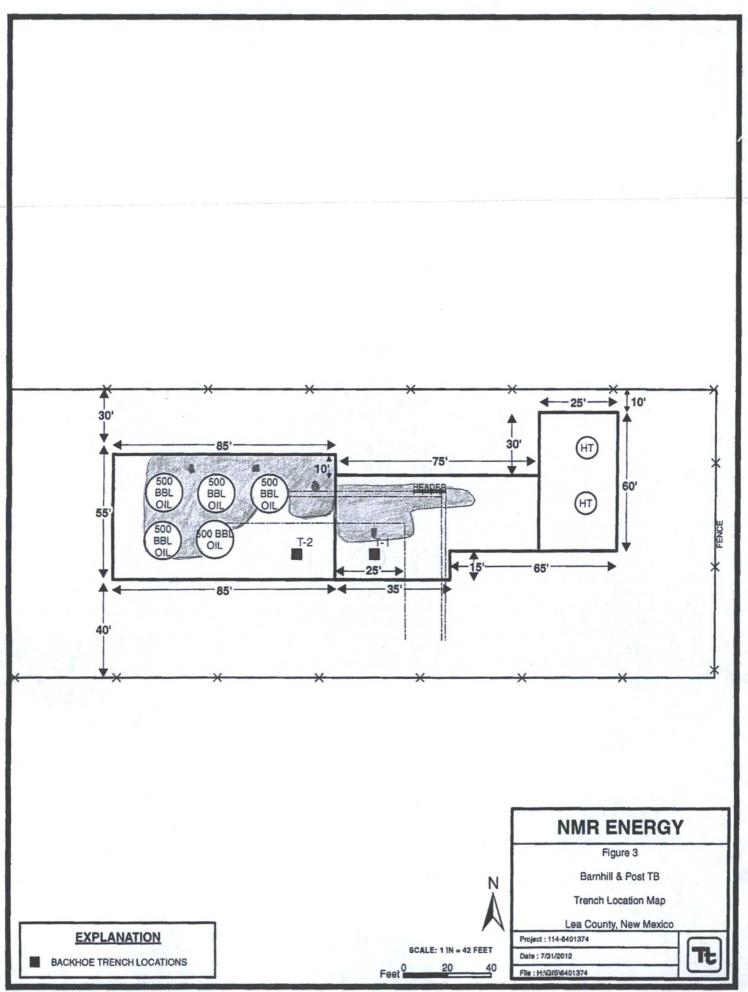
- F Description
- B Analyte detected in the corresponding method blank above the method detection limit
- H Analyzed out of hold time
- J Estimated concentration
- Jb The analyte is positively identified and the value is approximated between the SDL and MQL. Sample contains less then ten times the concentration found in the method blank. The result should be considered non-detect to the SDL.
- Je Estimated concentration exceeding calibration range.
- Qc Calibration check outside of laboratory limits.
- Qr RPD outside of laboratory limits
- Qs Spike recovery outside of laboratory limits.
- Qsr Surrogate recovery outside of laboratory limits.
- U The analyte is not detected above the SDL

### Attachments

The scanned attachments will follow this page. Please note, each attachment may consist of more than one page.

10	ST od No.)	SQJ	(hiA)	Settime Specific Spec									Date: 11-9-42		OTHER: Results by:	harges red:	Trial Thirt
LAGE	ANALYSIS REQUEST (Circle or Specify Method No.)	5 (EXt. to C35)	is Ag As Ba Cd is Ag As Ba Cd is Ag As Ba Cd 8240/8260/624 ni, Vol. 8270/625 7608	GC.MS Vol. TCLP Semi TCLP Semi	X								SAMPLED DY: (Print & Initial)	SAMPLE SHIPPED BY: (Circle)	DELIVERED	The	20000
Av Record			PRESERVATIVE METHOD	BLEX 8051E NONE ICE HNO3 HCF NONBEB OE	X X X NI				/////×			IN XX	1	Date: 10-10-12	Date: 121:22	P	ALEAGU ZCA MALL P.
nain of Custody	5	<b>TETRA TECH</b> 1910 N. Big Spring St. Midland, Texas 79705 (432) 682-4559 • Fax (432) 682-3946	EMANAGER: Ike Tararez Ab Ballon Lea lo Nu	SAMPLE IDENTIFICATION									RECEIVED BY: (Signature) - L	RECEIVED BY: (Bignature)	RECEIVED BY: (Signature)	RECEIVED BY: (Signature)	11- 20 Tel
Reduest of Chain		TETR 1910 N. B Midland, 1 (432) 682-455	LLC SITE MANAGER: PROJECT NAME: Borahili Tomb Batter	GOMP GPAB COMP GPAB	5x T-1 (0-1)	(2)1-1 ×	(1) X T-1 (4')	1 1 T-1 (S')	(1-0) Z-1 X	XT2(2)	X T-2 (4')	X T-Z (C)	Date:	F	Date:	ZP: ZP:	PHONE: DATE:
Analycic Re			CLIENT NAME: NASEbergy P	TIME			155	usb /	457	1458 / 1	459	40 10-9 S	RELINQUISHED BY: (Signature)	RELINOUISHED BY: (Signature)	REL NOUISHED BY: (Signature)	ADDRESS: ADD	CONTROLLE CONDITION WHEN RECEIVED:





### Leking, Geoffrey R, EMNRD

From:Leking, Geoffrey R, EMNRDSent:Monday, April 15, 2013 10:50 AMTo:'Tavarez, Ike'Cc:'hlamb@helmsoil.com'; dbaker@tumbleweedllc.comSubject:RE: NMR Energy - Barnhill and Post TB and Post #3 Well - Sampling Data and Figures

Ike

Delineation is still needed at both sites for chlorides. Remediation for TPH at the Tank Battery and chlorides at both sites. Apparently hydrocarbons were not a significant problem?

Talk about the details tomorrow.

Thank you.

Geoffrey Leking Environmental Specialist NMOCD-Hobbs 1625 N. French Drive Hobbs, NM 88240 Office: (575) 393-6161 Ext. 113 Cell: (575) 399-2990 email: geoffreyr.leking@state.nm.us

From: Tavarez, Ike [mailto:Ike.Tavarez@tetratech.com]
Sent: Monday, April 15, 2013 9:26 AM
To: Leking, Geoffrey R, EMNRD
Cc: 'hlamb@helmsoil.com'; dbaker@tumbleweedllc.com
Subject: FW: NMR Energy - Barnhill and Post TB and Post #3 Well - Sampling Data and Figures

#### Geoffrey,

According to our last correspondence for the sites, I had sent you the data to review, but we did not get around to discussed data and remedial options for the sites.

As requested, Tetra Tech collected soil samples using a backhoe at both sites. Two (2) trenches were installed in the Barnhill and Post Tank Battery and three (3) trenches at the Post Well #3. I would like to discuss the data and proposed remediation for each site tomorrow. Let me know if you additional information, thanks

Ike Tavarez Tetra Tech

From: Tavarez, Ike Sent: Tuesday, December 04, 2012 2:47 PM To: Leking, Geoffrey R, EMNRD

#### Cc: 'hlamb@helmsoil.com'; Kennedy, James Subject: NMR Energy - Barnhill and Post TB and Post #3 Well - Sampling Data and Figures

#### Geoffrey,

As requested, the sampling data for the above referenced sites are attached for your review. Please call me to discuss the data, so we can move forward on these sites, thanks

Ike Tavarez, PG | Senior Project Manager

Main: 432.682.4559 | Fax: 432.682.3946 | Cell: 432.425.3878

Ike.Tavarez@tetratech.com

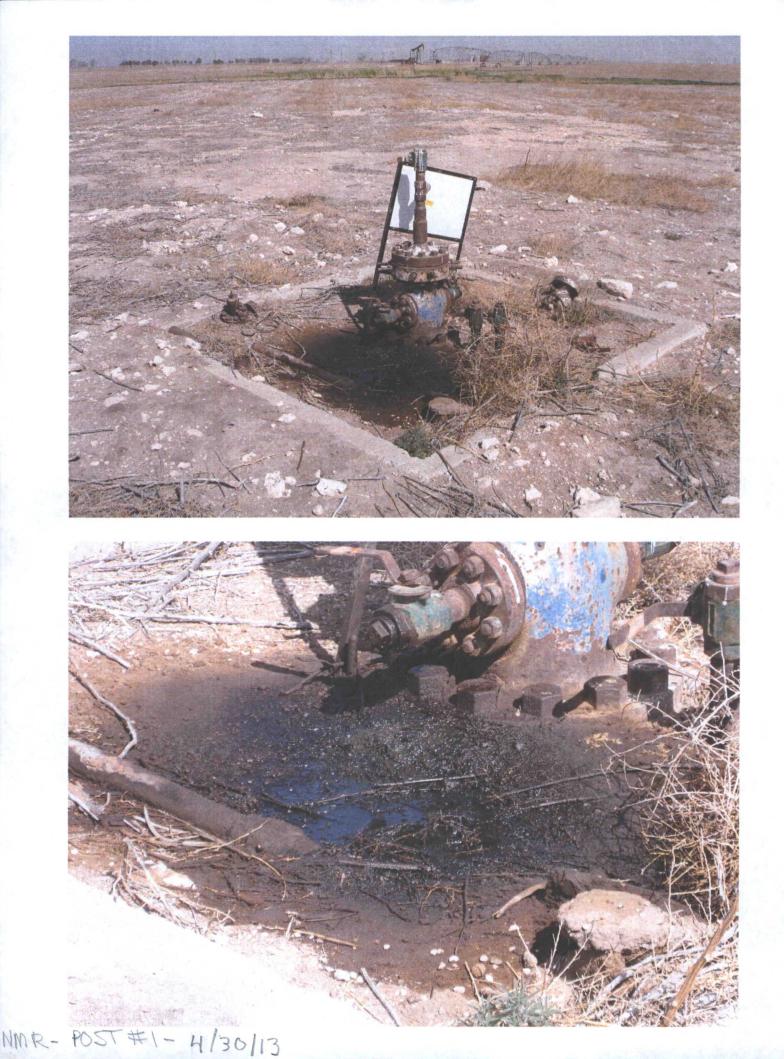
Tetra Tech | Complex World, Clear Solutions™

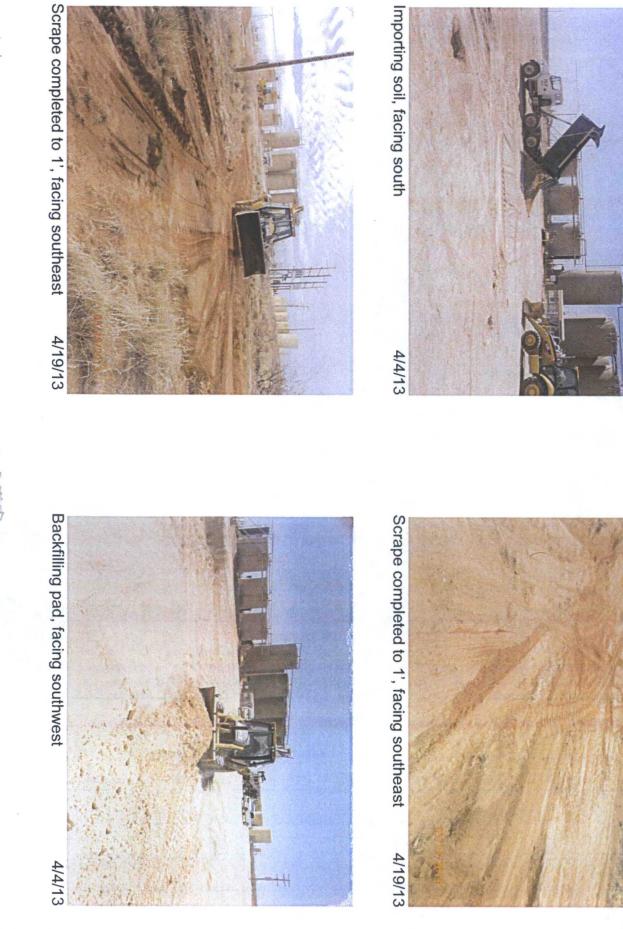
1910 North Big Spring | Midland, TX 79705 | www.tetratech.com

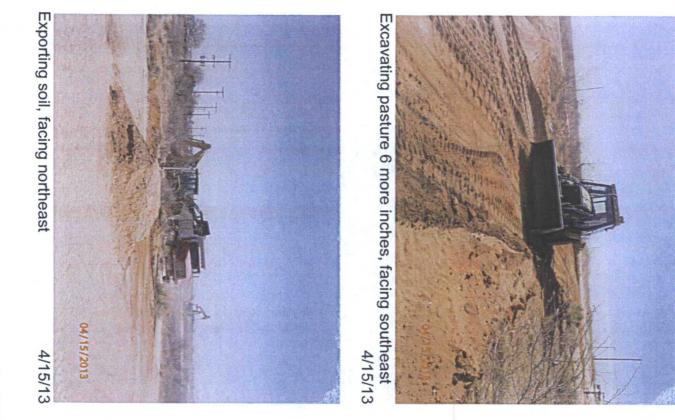
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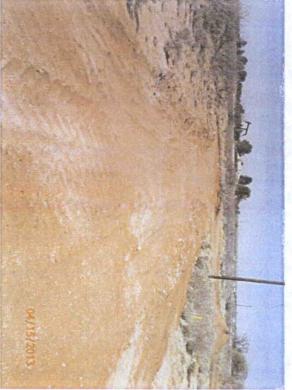
# **Chronology of Events**

8/24/10	Tetra Tech install backhoe trenches to define extents
9/19/11	Tetra Tech installed boreholes to define extents
1/27/12	Tetra Tech submitted work plan to the NMOCD
9/20/12	Tetra Tech met with the NMOCD to review work plan. According to NMOCD the work plan had not been reviewed.
9/28/12	Tetra Tech resubmitted (email) work plan to the NMOCD.
10/17/12	Tetra Tech requested (email) to start the site remediation.
	NMOCD response to work plan for additional delineation.
-4/16/12	









Excavation completed in north area, facing northwest 4/15/13